THE

SOUTHERN AGRICULTURIST.

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PART I.

ORIGINAL COMMUNICATIONS.

Some of the causes of the Decline and Fall of most of the Agricultural Societies of South-Carolina.

To the Editor of the Southern Agriculturist.

THE continually returning necessities of man, clearly demonstrate that his creator designed him for an intelligent and active Being. And, as if to superadd to his inducements to research and activity, he has endowed him with a susceptibility of mind, and structure of body, which become by indolence and inactivity, alike destructive to his health and happiness. The influence of climate has doubtlessly considerable agency in the formation of his habits, both of mind and body. Under a Southern sun, his sensibility is acute, his perception quick, and his growth precocious. With such a temperament, we need not be surprised to find him sanguine in the incipiency of every undertaking, backwards in its continuance, and impatient for its lumination. I have, Mr. Editor, been led to these reflections, by glancing over the catalogue of names of the Agricultural Societies of this State; and have found myself involuntarily exclaiming in the language of the inspired Prophet, "*where are they.*" With one or two expiring exceptions, they have either altogether ceased to exist; or are slumbering in fearful legthargy. Have the reasons which gave them existence ceased

to prevail, or have our institutions become less dear? Are the intonations of a gathering tempest, less loud and threatening? Or are the recent developements at Congress without meaning? Has the system of Southern Agriculture become perfect, the principles of rural economy established, and the complex government of our plantations systemized and ameliorated? These are not the causes. I shall attempt to enumerate some of them. Our Agricultural Societies were not sufficiently based upon economical principles. The prevailing inducement for gentlemen to assemble together, ought to have been the high and single desire for improvement in their calling. Terms of membership, ought to have been fixed so low, that the poorest might have satisfied himself that he received the worth of his money, in the information that he derived. This would have effectually closed the door against the admission of festive views; and our Societies, instead of presenting scenes of convivial entertainment, would have exhibited the fruits of successful experiments, and the rewards of honourable competition. As some of them exist at present, it is amusing to behold, how, as the hour for dinner comes on, the countenances which before were heavy and dull, become bright and radiant with expectation. And should some member at this hapless moment rise to protract the meeting; some dozen watches would leap from their fobs to rebuke his trespass upon their unwilling ears.

The spirit of party which had nearly paralized the energies of our State had here done its mischief too. An altar dedicated to so fair a goddess, should not have been polluted by so unhallowed a hand; no Uzziah should have been permitted to minister at her shrine.

That there should be among men, remarkable for worth and intelligence, a narrow and cankering spirit of jealousy, must be to all a matter of surprize. But it is no less true, than melancholy, that among no class of men, does this feeling so extensively prevail. Its effects have operated most banefully upon these Societies. The individual who crawls beyond the shell of his retirement, and appears in public, for the benefit of his vocation, has immediately either some most uncharitable motive imputed to him, or comes under the ban of that most sage and puissant declaration, "*a writing Planter is always a bad Planter.*"

Nullification, with its raw-head and bloody-bones, has passed by, and the tariff, with its concomitant evils, is gradually reclining its iron sides; still the tide of emigration is sweeping from us with increasing rapidity. We scarce need journey thirty miles from this city, before the memorials of desertion crowd thick around us. Is this not cause enough to inspire our concern and solicitude? South-Carolina must ever owe her prosperity to her agricultural interest; and had she among her distinguished sons, more Seabrooks, who like Bolingbrook, is "*Satis beautus ruris honoribus*," and who directs the resources of his mind, to the improvement of her agriculture, and the defence of her institutions, we might predict with less uncertainty the destiny that awaits her. I confess that I am unprepared to recommend any definite measures by which to arrest this evil. Thus much, however, I am prepared to say, that until the principles of agriculture are much more generally understood and practised, than they are at present, the inducements to emigration must continue to prevail. The rich and productive lands of Alabama and Mississippi, in despite of privations and diseases, will depopulate the less productive portions of our State. If this be true, it is the high and bounden duty of every patriot to lend his efforts to stay this growing calamity. South-Carolina has very properly been called the Frontier State, in which the battles for Southern Institutions are to be fought. But if the flower of her chivalry is thus drained from her, of her territory a conquest must be made, not by victory, but by desertion.

COLLETON.

An Historical Sketch of Gardening.

(Continued from page 8.)

To the Editor of the Southern Agriculturist.

In continuing an Historical Sketch of Gardening, I shall be under the necessity of amusing your readers with selections from various writers on the subject; and will endeavour so to embody or condense what is selected, as to answer my purpose, at the same time to afford them an opportunity of knowing what has been said upon the subject, by various writers, without the trouble of research, by a reference to your register.

Gardening has been a theme for the pen of the celebrated Lord Oxford, he thinks it was one of the first arts that succeeded the building of houses, and naturally attended it. Culinary, and afterwards medical herbs, were objects to every head of a family, it became necessary to have them at hand, without seeking them at random in woods and meadows when required; when the earth ceased to produce spontaneously all the primitive luxuries, culture became requisite, as well as separate enclosures.

A cottage and a slip of ground, such as we see by the side of a common, were, in all probability, the earliest gardens; a well and a bucket, succeeded to the Pison and the Euphrates.

As settlements increased, the orchard and the vineyard followed; and the earliest princes of tribes, possessed just the necessaries of a modern farmer.

The Hanging Gardens of Babylon were a great prodigy. We are not acquainted with their disposition or contents; but they are supposed to have been formed on terraces and walls of palaces, whither the soil had been conveyed at great labour and expense.

From the days of Homer to those of Pliny, we have no traces of what were the gardens of the intervening ages; when Roman authors, whose climate instilled a wish for cool retreats, speak of their enjoyments in that kind, they sigh for grottos, coves, refreshing hollows in mountains near shady founts; or boast of porticos, walks of plains, canals, baths, and breezes from the sea—their gardens are never mentioned.

Pliny has left descriptions of two of his Villas—his Laurentine and Tuscan Villas—the first he used for his winter retreat; all he says of it is, that the gestatio, or place of exercise, which surrounded the garden, was bounded by a hedge of Box, and when that was perished, with Rosemary; that there was a walk of Vines, and that most of the trees were Figs and Mulberry, the soil not being proper for any other sorts.

The garden of his Tuscan Villa, a summer retreat, makes a considerable part of the description; and what was the principal beauty of that pleasure ground? Exactly what was the admiration of England a century ago: Box trees cut into monsters, animals, letters, &c., in an age, when architecture displayed all its grandeur, purity

and taste; the ruins of which will excite our astonishment and admiration. A Roman Consul, a polished Emperor's friend, and a man of elegant literature and taste, delighted in what a mob now scarce admire in a public garden.

In the Paintings found in Herculaneum, are a few traces of gardens, as may be seen in the 2d vol. of the prints; they are small and square, enclosures formed by trellis work and espaliers, and regularly ornamented with vases, fountains, &c. proper for the narrow spaces allotted to the garden of a house in a capital city.

From what has been said, it appears, how naturally and insensibly, the idea of a kitchen garden slid into that which has for so many ages been peculiarly termed a garden.

A square piece of ground was originally parted off, in early ages, for the use of a family, to exclude cattle; and ascertain the property, it was separated from the fields by a hedge; as pride and desire of privacy increased, the inclosure was dignified with a wall; and in climes where fruit was not lavished by the ripening glow of nature and soils, fruit trees were assisted and sheltered from surrounding winds; for the inundation of luxuries which have swelled into general necessities, have almost all taken their source from the simple fountain of reason.

I will conclude this article with Homer's description of the garden of Alcinous.:—

Close to the gates a spacious garden lies,
From storms defended and inclement skies.
Four acres was the allotted space of ground,
Fenc'd with a green enclosure all around,
Tall thriving trees confess'd the fruitful mould,
The reddening Apple ripens here to gold.
Here the blue Fig with luscious juice o'erflows
With deeper red the full Pomgranate glows,
The branch here bends beneath the weighty Pear,
And verdent Olives flourish round the year.
The balmy spirit of the western gale
Eternal breathes on fruit untaught to fail:
Each dropping Pear, a following Pear supplies,
On Apples Apples, Figs on Figs arise:
The same mild season gives the blooms to blow,
The buds to harden and the fruit to grow.
There order'd Vines in equal ranks appear,
With all the united labour of the year—
* * * * * *
Beds of all various herbs, for ever green,
In beauteous order terminate the scene.

Two plenteous fountains the whole prospect crown'd,
This through the garden leads its streams around:
Visits each plant and waters all the ground,
While that in pipes beneath the palace flows,
And thence its current on the town bestows—
Such were the glories which the gods ordained,
To grace Alcinous and his happy land.

W. X.

The Percussion Lock.

Charleston, February 17, 1835.

To the Editor of the Southern Agriculturist.

Mr. Editor,—The readers of your very useful publication, are under obligations to a writer in your January number, under the signature of "*Scriberius*," for the correct history he has given of the improvements in the gun-lock. It is evident from his whole communication that he is thoroughly acquainted with the principles, both of mechanics and chemistry. But he is evidently more familiar with the use of the lathe and retort, than with that of the gun; and it is to correct, what I apprehend to be an error, in the directions he has given, respecting the best mode of avoiding accidents by the percussion lock, that I am induced to trouble you with a few remarks.

"*Scriberius*" states in drawing a comparison between the safety of the flint and percussion lock, "The lock of the flint gun gets frequently out of order, goes off at half cock, and may be fired off by a child. In the hands of a grown person, an attempt to pull the trigger at half cock frequently takes place, and the gun is discharged. Not so in the percussion lock; for when loaded, the cock is always down upon the cap, the pulling upon the trigger, therefore, cannot operate upon it." And further on—"Let us suppose that the spring of a percussion lock is capable of moving 20lbs. the *momentum* which forces the cock upon the copper cap, will be a trifle more than this, if the cock therefore is let down and remains upon the cap, the latter will be pressed down upon the nipple with a force equal to 20lbs. and will in that condition require *very little more force* to ignite the cap, and *this force is obtained by stricking the butt of the stock upon the ground, in some cases even very gently*, for it must be recollected that the whole force of the spring is pressing upon the cap, and

any addional force created by a jar or blow on the gun will discharge it."

And after having thus clearly pointed out the danger, let us see the remedy he proposes to avoid it. "Therefore," says he, "a cautious sportsman will never strike the butt of his gun upon the ground, nor put it in a situation where it may fall down when it is capped." &c.

From these quotations, it is evident that "*Scriberius*" intends the sportsman to carry his gun with the cock down, and pressing on the cap, and he advises that "the cap should not be placed upon the nipple, until he is ready for immediate action." The former direction I consider unphilosophical, and the latter, (if I rightly understand him) unports manlike. If "*Scriberius*" carries his gun with the hammer resting on the cap, accidents will occur notwithstanding all his caution, and if he waits, till he starts his game before he places his cap on the nipple, I feel assured that his game bag will remain empty. I once heard of a Frenchman who was so expert as to be able, after the partridge had taken wing, to draw out his box, open it, help himself to a pinch of snuff, and after having put the box in his pocket, he deliberately shot the bird, before it had time to get beyond the reach of his gun; but I apprehend he could not have accomplished this matter so easily if he had been subjected to the additional detention of putting on a percussion cap. But, perhaps, "*Scriberius*," when he speaks of not putting on the cap till "ready for immediate action," means that the cap should not be placed on the nipple till the sportsman is actually in the field—if so, I agree with him in this. But I can speak from some experience, that it is always dangerous to carry a loaded gun with the hammer pressing on the cap. Let your gun be carried with the cock half bent, and there is comparatively little danger from accidents. In this case, it requires a double process to set it off—it must first be cocked and then the trigger be pulled, and there is scarcely any concussion which will occasion these two opposite effects. All the accidents with the percussion lock that I have ever known to occur, were occasioned by the individuals walking and riding with a gun, the hammer of which was resting on the cap.

Let me conclude with a few words of advice to the sportsman.

Never neglect your business for the sports of the field. There is a trite saying, "Hunting is a fine amusement, but a bad trade." When you go out for exercise or recreation use a well tried gun—a twisted barrel is always to be preferred. Let your powder be good. Dupont's or Beaty's FFF American, has always satisfied me. Let your wadding be cut from pasteboard, or from an old hat. If wadded with paper, portions of it sometimes remain ignited in the barrel, and occasion accidents in reloading. If in the country, a loaded percussion gun will be perfectly safe, if the cap is taken off, the nipple carefully wiped, so as to free it from all particles of percussion powder, and the cock let down to prevent the powder from running out. If in the field, carry your gun half cocked. As the bird rises, or the animal starts, cock your piece at the moment you are raising her to to your shoulder, and you may pursue this innocent amusement for years without much danger of accident.

PERCUSSION.

Account of the Mineral Springs of Virginia.

(Continued from page 72.)

THE *Red Sulphur Spring* is but a pleasant mornings ride from the *Salt Sulphur*, being about eighteen miles distant. The road is somewhat hilly, but good, and a company are now engaged in constructing a turnpike, from the *White Sulphur* by the *Salt Sulphur* to this place, which when completed, will make the whole ride much more agreeable, even now, it is gone over with the greatest ease between breakfast and dinner. It is situated near the termination of a long and very narrow valley, no where wide enough for a good location for improvements, and particularly circumscribed at that part where the Spring is. The direction of this valley is nearly North and South, and between two and three miles long, but so narrow, that with a few exceptions, (and those of no great extent) a stone can be thrown from the base of one mountain to that of the other, consequently, the view is extremely limited.

When I first visited this Spring, in 1828, the mountains on both sides of the Spring were well wooded, which, combined with their proximity to each other, was thought

to render the valley more damp, in as much, as the sun did not appear above the trees until near 8 o'clock in the morning, and was hid behind the western mountain before 5 in the afternoon. This was the foundation of many injurious and false reports relative to the healthiness and comfortableness of this place. But really, so far from these being objections, I always considered the exclusion of the sun for such a length of time, especially in the afternoon, as a considerable advantage over the other Springs, for there was a constant circulation of air through this long valley, and from comparison, I did not think it as damp as the Salt or White Sulphur: of this, I judged by the frequency, duration and heaviness of the fogs. In point of coolness, there was nothing to complain of. The temperature was generally delightful, and I well recollect that in '29 I slept with a blanket and woollen coverlid on my bed, during the greater part of the time I remained, which was for about six weeks in the midst of summer. This objection, has, however, been removed by the present proprietor. The trees on both sides of the valley, contiguous to the Spring, have been cut down, and thus, more light has been afforded, and a more open appearance given to the place. No distant view, however, is, or can be obtained from where the buildings are, as they are completely shut in, by the mountains.

Under the direction of Mr. Burke, (the present proprietor, who purchased it in October, '33) the whole place has undergone such a change, that it would not be recognized by those who visited it at the time I first saw it. The whole establishment then, consisted of from fifteen to twenty cabins, many of them in very bad condition —a large barn-like building, in which the meals were served up, but which was neither ceiled, plastered, or even white-washed, and without a single sash—a tolerable stable—and a small building over the Spring. So dreary was the appearance of the place, that none visited it for pleasure, and many who might have been benefited by the use of the waters were kept away, by the reports and descriptions given of it. From twenty-five to thirty persons were about the numbers usually found there, even when the other Springs were crowded.

The whole place, as we have already stated, has undergone a change. Many of the old cabins have been re-

moved. There are now,—a large two storied building, containing on the lower floor, a dining room sufficient for two hundred persons, with a drawing room attached, whilst the upper is occupied with chambers. Another very large and elegant two storied building, containing sleeping apartments, and I believe a ball room*—a long range of single rooms—another, containing two ranges of rooms connected together by doors—a number of cabins —bath rooms, and stables.

There are here, two Springs, but they do not differ in quality, and are believed to be from the same source. They have undergone as great a change in appearance as the buildings. Formerly, that which is now, the largest Spring, was inclosed in a small house, and used for keeping the milk and butter cool; the small Spring was the only one used by visiters, it was inclosed in a section of a hollow log, called in that part of the county a "*gum*"—neither were large, nor did they yield a large flow of water. Now both are under one roof, inclosed with white marble slabs, and in consequence of the excavations made, several springs have been united, and form one of the handsomest and largest fountains found at any of the Springs. The water is beautifully clear and cool, and at the bottom of the Spring, as well as where it passes along, is seen a substance of a brilliant purplish red, (from which the name of the spring is derived) and which has hitherto puzzled the curious to discover what it was. Professor Rogers, who visited and analysed all of the Virginia Springs last year, supposed it as well as that found at the *Grey Sulphur*, to be a vegetable substance—he has no doubt fully satisfied himself on this point long ere this.

This water is highly and justly celebrated in pulmonary cases. I have in the several years in which I visited it, seen great changes effected, and many who came apparently on the borders of the grave, return home in comparatively good health. Those who were but slightly affected were apparently restored to health. In my own case, I can speak highly of its efficacy, and to its virtues I attribute the comparative restoration of my health. It has a powerful tendency to lower the arterial action, and the pulse has been reduced by it from 104 to 80 in the 24 hours. This water is also said to

* It was not completed when I left there.

be highly efficacious in other diseases; but having taken no notes in '28 and '29, I cannot now recollect them, and in '33, although the company was very large, I was too unwell to mingle much in it, and although there may have been many remarkable cases, yet I did not get acquainted with their particulars. I can, however, say, that in all cases in which the lungs are affected, or in which there is internal inflammation, this water will be found of the greatest benefit.

The *Red Sulphur* is no longer what it was in 1828 and '29, a dull and dreary looking place. Since it has changed proprietors, it has undergone a radical change. Mr. Burke, the proprietor, and Major Vass, the manager, have been indefatigable in their exertions, to render the spot as agreeable as possible, and they have been handsomely rewarded for their attention to the wants and wishes of their visiters, by the increase of company, and the high terms in which the establishment is spoken of. It is now a very fashionable Spring, and was excessively crowded, both the last and preceeding season.

Continuing onwards, and still in a Westwardly course, you arrive at the small village of Peterstown, situated about nine miles from the *Red Sulphur*. Three quarters of a mile from this village, in a Southwardly direction, are the *Grey Sulphur Springs*.

In one of my rambling excursions about the country in 1833, I became accidentally acquainted with this Spring. At the time, it was quite insignificant, there being only a small excavation in the rock containing not much more than a good basin of water, with scarce any trickling from it, and a small rough shed over it. It was thought to possess some medicinal virtues, but what they were none knew, and all appeared to think lightly of it. All that I could learn was, that in two cases, apparently pulmonic, this water had proved extremely beneficial. After an examination, I became the purchaser, and had the rock opened, and obtained an abundant supply of water. A subsequent analysis, discovered its value, and a building was erected and opened for the reception of company the last season.

Originally there was but one spring, but wishing to ascertain whether by passing through the upper strata of rock, (for the water flowed through a perpendicular crack) I caused a small opening to be made a few feet distant

from the other Spring, and then bored to the depth of fifteen feet, when the workmen struck on a small Spring, which proves to be entirely distinct from the other, and possesses entirely different properties, and consequently differs in its action on invalids. The original Spring is designated as the "Large Spring," and the one last discovered as the "Small Spring." Of their properties, I shall now proceed to give an account, having paid particular attention to their action during the last season.

From a partial analysis made in this city, the waters of the large Spring were found to be strongly impregnated with alkalies, and hence it was supposed that they would prove beneficial in dyspeptic cases. This was abundantly confirmed the last season. Both the Large and Small Springs were subsequently examined by Professor William B. Rogers, (of William and Mary's College,) who visited and analysed all of the Springs in that section of country resorted to by invalids. I was in hopes to have been able to have obtained a correct and minute analysis in time for this notice. Other engagements have prevented him from completing it, and I must content myself with merely stating, for the present, that he expressed a high opinion of the Large Spring. He pronounced it to be a strong alkaline water, the only one of the kind in that section of country, and stated, that he was aware of there being another similar to it in the United States. The other Virginia Springs are composed principally of neutral salts. The Small Spring is also of an alkaline nature, but differs materially from the Large Spring in its constituents.

I am glad to have it in my power to give a more detailed account of their medicinal qualities, and as these are new Springs, consequently but little known to the public, I may be excused for being somewhat more minute, especially as they differ in their qualities from the other Springs, and promise to be of great value to invalids. From the strong alkaline quality of the *Large Spring*, it was natural to suppose that it would be highly serviceable in dyspeptic cases, and this was found to be eminently the case. So powerful is it, that acidity of the stomach is almost immedietely neutralized by the use of one or two glasses of this water, and I have known the fermentation checked, and the disagreeable sensations re-

moved, even when the eructations had become so frequent as to be extremely unpleasant and annoying. I have also known head aches and nausia speedily relieved by the use of a small quantity of the water; these, as is well known to all, are the most common and certain signs of indigestion. In fact, it exerts a most powerful influence on the digestive organs, greater than I have ever witnessed in any other water or medicine, for it not only neutralizes the acidity of the undigested food, and thus prevents its irritating and injurious effects on the membranes of the stomach, but appears to give an increased activity to these organs, and to bring them into a more healthy action. The invalid soon loses the oppression, feeling of distension and other disagreable sensations, so frequently (I might almost say, constantly) felt by the dyspeptic; his food becomes better digested, of which he is soon sensible; his appetite increases, and he partakes more freely of food, and without feeling any unpleasant sensations; his strength increases, and unless he is very imprudent, he experiences great relief. His recovery, of course, will depend much upon his prudence, not only whilst he is at the Spring, but also after his return home.

This water is diuretic and but mildly purgative, if so at all. Its action on the system is, however, peculiar. *It acts powerfully on the liver, whilst at the same time the arterial action is not increased, but on the contrary, lowered.* That it acts on the liver, and that powerfully, is evinced by the total change which takes place in the colour of the fæces, and the clearing up of the complexion. The first, very often takes place in twenty-four hours, and the last in the course of a week. That it does not excite the arterial action, is evident to all who drink of it. That it lowers this action, was made very evident in a case of hemorrhage which occurred last season. In this case the pulse, when first felt, (about an hour after the occurrence,) was 118. This was about 10 o'clock in the morning, at 4 P. M. it was at 86, and the next morning at 84,—during this time the individual had used about six or eight tumblers of the water. The importance of a Spring possessing this quality, viz. stimulating the liver into a healthy action, without irritating or exciting the system, will be evident to all medical men, who are aware that there are several diseases in which it is highly desirable to excite the

liver, and which it is difficult to do, on account of the inflammation which exists internally. But it is not my province to point these out.

This water has also the effect of allaying internal irritation, and especially irritability of the stomach. Several cases occurred last leason, one in particular, I will briefly state, as it was very strongly marked.

A gentleman from the West, reached the *Grey Sulphur* about 4 o'clock in the afternoon, he had been taken with a violent vomiting early in the morning which had continued all day, and so irritable had his stomach become, that he could not retain *two mouthfuls of water*. Immediately on his arrival he went down to the Spring, and in the course of fifteen or twenty minutes drank six tumblers of the water, which not only did not nauseate him, but entirely relieved him, and that night he eat a remarkable hearty supper, from which he experienced no inconvenience, not even being nauseated after taking it. This was certainly an imprudent act, for one who could not five hours previously retain two mouthfuls of water; but it proved the powerful effects of this Spring.

It is, however, in dyspeptic or chronic diarrhea, that this water produces the greatest effect, as was experienced by many who visited it last year. Some were of the very worst character, and *all*, as far as I was able to ascertain, experienced the greatest relief, whether the benefit proved permanent or not, of course depended on the prudence they exercised afterwards. I have in my possession statements of these cases, but it would not be proper to give them here, though I will willingly communicate them to any person desirous of further information.

All that I have said above relates to the Large Spring. The Small Spring is a powerful cathartic, supposed by many of the visiters to be equally as much so, as either the *White* or *Salt Sulphur*, and appears to produce similar effects on the system. Most of the visiters confined themselves to the Large Spring, and only used this occasionally. It was principally used to regulate the state of the bowels, for which purpose it is highly serviceable. In what particular diseases it would be advisable to use it alone, remains yet to be tested; but I would not hesitate to recommend it, in any, in which the *White* or *Salt Sulphur* have been used with success. I could say much

more relative to the properties of these Springs, but will only add, that the *Grey Sulphur Springs* will be found of eminent service in all dyspeptic cases, and in all diseases originating in dyspepsia.

I have thus given you an imperfect sketch of the Virginia Springs, situated in that particular section of country, and I cannot but repeat my regret, that I am unable to state precisely the medical properties of the different Springs, or the various cases in which they have been found beneficial. As a general rule, I would say, that those cases which originate in a diseased state of the liver, especially where that organ has become torpid, would be benefited by using the *White Sulphur*, *Salt Sulphur* and *Sweet Springs*, and by bathing in the *Hot Springs*. But whenever the lungs are affected, or there exists any internal inflammation, those Springs ought to be avoided, and the *Red* and *Grey Sulphur Springs* alone used. By having a reference to this division, the invalid will soon be able to discover which particular Spring is best suited to his case: and this ought by no means to be neglected, for I have known serious consequences ensue by a free use being made of a Spring not suited to the case. The disease was pulmonic, and the injurious effects were produced by drinking of stimulating waters.

It unfortunately happens that there are no physicians located at the different Springs, nor are they annually visited by the same medical men, with (I believe) the exception of the *White Sulphur*, consequently, advice has very often to be taken from those who, however, eminent in their professions, are in all probability, unacquainted with the virtues of the different Springs, therefore incapable of giving correct advice relative to the particular Spring, which ought to be used by the patient, and the mode in which it is most efficient, or the quantity which should be taken: they having themselves to learn these particulars by visiting each, for as yet, there is no work relative to these Springs, and the only account given of them at all, is a very concise one in, Bell on Baths and Mineral Waters. I am happy to have it in my power to say, that this will not long be the case, Professor W. B. Rogers, who ranks high as a chemist, visited them all the last season, for the express purpose of examing and analysing them. The result of his investigations, I am informed, will be given to the public early in

the Spring, and hereafter physicians will be able to form some opinion of the qualities of the different Springs, from the analysis, and have some guide as to which of them they shall direct the invalid applying for advice.

I remain, yours, &c.

JOHN D. LEGARÉ.

Causes of Emigration.

To the Editor of the Southern Agriculturist.

Mr. Editor,—Having proposed, in your January number, to examine some of the causes which induce the stream of emigration to flow *from*, and not *into* our State, we are led, in the first place, to inquire whether any changes of soil or climate have rendered our native land less fruitful than she was of old; and in the second place, whether we have not ourselves undergone some change, and, since the introduction of cotton, become more anxious to grow suddenly rich; and are content to abandon all the comforts of home and friends and civilization, in order to double our income. The second cause has in some measure produced the first; a certainty of obtaining cheap and productive lands in the West, has rendered the cotton planters of the middle and upper districts, careless concerning any benefit beyond the growing crop; satisfied, that when their present fields are exhausted, they can be sold for what will purchase fresh Western lands, they pursue a system of husbandry, so reckless, that were the destruction of land and life equally felonious the Courts of Sessions would never adjourn.

A farmer had better emigrate, than continue to cultivate exhausted lands, but would it not be preferable to remain at home without exhaustion? A blacksmith in the upper country who had, by industry and frugality, amassed several thousands dollars, went to Alabama to purchase land and become a farmer. Returning after a few weeks, he said, that all the accounts of the crops of that country were true; that the soil produced as much cotton, independent of seed, as the Pendleton land produced with the seed. On being asked where he had purchased, he replied, "No where; I asked every person with whom I became acquainted, whether he had gain-

'ed or lost by emigration, and all, with one exception, 'agreed that they had better have stayed at home." Let us examine whether a planter can remain in Carolina, and realize a fair interest on his capital without exhausting his fields.

In estimating the production of capital, we should never lose sight of the permanent benefit or injury sustained by the capital itself. If a stockholder vests $10,000 in bank or funded stock, and obtains an interest of five per cent. per annum, and also sells privately $1,000 worth of his stock at the end of each year, he will appear to the world to be a thriving man, deriving from his property $1,600 the first year, $1,530 the next, and so on—but at the end of ten years he will be worth nothing. May not this be the cotton planter's case? If by the usual mode of culture his lands are deteriorated 10 per cent. per annum, the result, as far as landed capital is concerned, will be similar to the stockholder's above mentioned. This depreciation in uplands is not chimerical, and accounts for the universal spirit of emigration which pervades the interior. The present mode of ploughing, (up and down hill) with those destructive implements, the gofer, and shovel ploughs, is sufficient to exhaust any soil above the falls of the rivers, except alluvial or bottom land. When to this we add the exhausting nature of the corn and cotton crops, the surprise is, not that the lands and owners are ruined, but that they should still pursue a system where ruin is inevitable. It is undeniable that while the lands are fresh, and full of fibres and roots, cotton and corn are the most productive crops: it is equally true that after a few years the same productions are so much diminished, that a change of system or of land becomes indispensable. In order to avoid the numerous evils attending emigration, it is only requisite to change the mode of husbandry. Horizontal ploughing is the most important improvement; it is as easy for the ploughman, and far more so for the horse than straight ploughing up and down hill; a man and boy with a common land compass, can lay off ten or twelve acres in a day for the most accurately level ploughing. Under this system, the land never washes in the hardest rains, and the most fertile parts are retained in the field, while under the old plan, every rain may be said to cause more injury than benefit

to land recently ploughed, as each plough-furrow becomes a sluice for the water to carry off the richest portion of the soil.

The next evil to be remedied is the plough: in a country where manuring is not yet introduced, it is important that every particle of vegetable manure not harvested for our use, should be returned to the soil. A very small portion is returned when we use the gofer, or shovel plough. If all the stubble, grass and weeds that remain after the crop is taken off, were carefully returned to the soil by a bar-share plough, they would afford nourishment to the succeeding crop, whether of cotton, corn, or small grain; but under the present system, the land is merely pulverized by a gofer plough, and all the vegetable matter left on the surface, exposed to the alternate exhaustion of sun and rain, dew and frost.

The third and last evil to be noted, is the injurious succession of crops; a man is esteemed a prudent farmer who *rests his land*, as it is called, by sowing it in wheat or oats the same year that it has produced a crop of corn, and this without any other manure, than what is turned in by a gofer or shovel plough. When this second crop is harvested, cattle, sheep, and horses are generally turned into the field to devour the grass and scattered grain, and the land is supposed, under this system, to be so completely rested, that it will produce a crop of cotton or corn the following year. Under such a system of agriculture, Mr. Editor, we are not to be surprised, that our crops of wheat seldom exceed six or seven bushels per acre, oats and corn about twice as much.

When leisure permits, I will endeavour to suggest a different rotation of crops, derived from the systems of more experienced and practical farmers, than—

Your's, respectfully,

C. C. PINCKNEY.

On the Skinless Oats.

To the Editor of the Southern Agriculturist.

Dear Sir,—I readily comply with your request, in giving you all the information I possess, relative to the Skinless Oats, which I have had under cultivation for the last three years. My experience, as far as it extends, fully

corroborates the opinion, so generally expressed, in the English and Northern agricultural publications of its superiority over the common oats; and I feel convinced, when better known here, that its value will be highly appreciated, from its peculiar adaptation to this climate —it being found sufficiently hardy to withstand the ordinary severity of our winters.

In March, 1832, a friend gave me a few of the seeds, which came from Europe. I immediately committed them to the earth. From some defect, only three gains vegetated. These, I nourished with great care, and obtained therefrom about a pint of seed. I divided this quantity equally, and sowed (in drills fifteen inches apart) at two different seasons, namely, on the 20th of October, 1832, and 4th of February, 1833. The fall planting endured the winter without any apparent injury. Its product was not equal in quantity to that sown in the spring, though the grain was larger and heavier. The growth is very similar to the common oats, but far surpasses it in the richness and luxuriance of its blades, and the number of stocks and ears. These qualities, combined with its rapidity of growth, would render it particularly valuable to those, who make use of oats in a green state, as food for horses and cattle, as it furnishes one of the earliest, most nutritious, and abundant grasses that can be cultivated. I have just caused to be sown, chiefly for this purpose, about eight bushels of the seed, in an unshelled state, being the product and remainder of my last year's crop, after distributing a portion amongst my friends, and losing a great deal by the depredations of rats and mice. The chief objection to this grain, as a crop, is, the great loss sustained by the shelling of the seed in the field when ripe, and the ease with which the birds are able to devour it. They appear particularly fond of it, and require as much minding as in a rice-field. The first of these difficulties, however, might be obviated, by harvesting the crop before it is fully ripe, in the manner now usually adapted with wheat.

The Skinless Oats is represented to have come originally from Shantez, a remote district in China. It was first introduced into Holland, and from thence into England, where, in 1830, it was grown for the first time. The following extract, taken from the proceedings of the Warwickshire Agricultural Society of England,

will furnish some idea of the high opinion entertained of its value. "The advantages which this extraordinary 'and valuable grain possesses over all other kinds of 'oats, are numerous, viz: when threshed from the sheaf, 'it is exactly like oatmeal, and it is fit for immediate use 'for culinary purposes, and every other sort which oat-'meal is consumed for, the grain being quite free from 'every particle of rind or husk. The flour is delicious, 'and it contains much more farinacious matter. There 'is, of course, considerable saving of oats and expense of 'kiln drying, sifting, &c., and one peck of it contains more 'nutritious food for a horse than three pecks of common 'oats. The produce is astonishing, the average being 'twenty-six barrels of fourteen stone to the Irish acre, the 'exact quantity grown by Mr. Derenzy, on one acre. It 'was not sown till the 4th of May, 1830, and reaped in 'August the same year."

A friend in Virginia, to whom I sent some of the seed, writes to me as follows: "Since I saw you, I have seen a 'good deal written on the Skinless Oats, and if it proves 'to be as valuable as stated, it certainly is a great acqui-'sition to the agricultural and farming interest of the 'country. I have sown a few of the oats for the purpose 'of ascertaining whether they will stand *our* winters, as 'they do the winters in England, where *two crops* of them 'have been raised in the year. This oat, is a native of 'the province of Chang-Tong, in China, in about the 'same latitude as North-Carolina and Virginia."

I remain, yours, &c.

A. G. ROSE.

20th Febrnary, 1830.

A new variety of the Common Turkey, (Meleagris gallipavo.)

To the Editor of the Southern Agriculturist.

Sir,—It is well known that quadrupeds and birds produce varieties in proportion to the length of time that has elapsed since they were originally domesticated. Thus the horse, the cow, the common fowl, and duck, &c. have produced infinite varieties in size, shape and colour, in consequence of their having been for many years domesticated, and having been subjected to different modes of treatment, and exposed to a variety of climates. The Guinea and Pea fowl having been subjected to the con-

trol of man more recently, have not undergone so great a change; but varieties in these are beginning to appear. Pea fowls are now occasionally found, white in the Eastern continent, and with us, Guinea fowls of a black colour, and also snow white are not very uncommon. The Turkey is now found under every variety of colour, but this is the only change that domestication has as yet produced, except a less prominence in the breast of the tame, than the wild Turkey.

I have recently had presented to me a singular and beautiful variety of the Turkey, raised on the plantation of Dr. Desel, at Goosecreek. The information which has been given to me of the origin of this curious production, is the following:—A year or two since, a Turkey was raised on the plantation with a single long feather growing from the top of the head, and, during the last summer, one of the progeny was found wild with a large and ornamental tuft on the head, resembling in appearance that of the domestic fowl, which goes under the name of Dutch top-knot. The poultry woman on the plantation, believing this tuft to be a deformity frequently plucked it off, but it soon grew again, and is now as large and ornamental as ever. There is little doubt in my mind, that by propagating the breed from this bird, (which proves to be a fine male) a permanent variety will be produced.

A.

On the Management of Peach Trees.

To the Editor of the Southern Agriculturist.

Mr. Editor,—The season having arrived, when our attention becomes necessary to ensure success in the cultivation of our fruit, a few remarks to such of your readers, as may be interested in the subject, may not prove unacceptable.

It is a singular fact, and one which has never been satisfactorily accounted for, that whilst Peaches of the finest and most luscious character are produced within the City of Charleston, attempts to cultivate them on the Neck have always proved abortive. It has been supposed, that the smoke from the city may have some influence in the destruction of the insects that prove so deleterious to the tree, yet within a few miles of Charleston, Peaches sound and good are reared, which if they do not vie with those

of the city, may be accounted for from the want of due care and attention in the cultivation.

The bark of a tree may be compared with the skin of animals, which serves not merely as a covering or case, but contains many important vessels, highly essential to its health and prosperity, and thus, it is, that like the human being, that outer covering developes the general state of disease, under which the body is labouring. A want of healthy action in this portion of vegetable physiology, is always indicated by a tough hardness in the bark, itself putting on the appearance of old dried leather, and becoming almost impenetrable to the thumb-nail; this disease is termed bark-bound, and in some instances it may be relieved by making an incision through the outer bark of the trunk down the inner bark or *liber*, taking care not to wound the latter. When any one of my trees is in the state I describe, unless I value it highly, I remove it, so as to replace it with one of less equivocal character.

There is nothing which evinces that the bark should be kept in a healthy state, and free from injury, than the fact of the certain destruction of the tree, by oiling it, or indeed, I apprehend, by the application of any unctious matter. The bark of the tree frequently accumulates a quantity of dust in dry weather, this, after a while, forms a kind of crust, which in wet weather, makes the bark appear of a very dark hue; after a rain is the most proper time to remove this filth, which ought to be done with some dull iron instrument, a piece of old iron hoop answering every purpose, and then scoured with a solution of soap and sand, taking care that the soap be afterwards washed off. This process of scouring the tree should be performed as often as occasion may require, without regard to the season. There is a considerable advantage derived from this attention. Numerous insects, many of them microscopic, that feed upon the juices of the bark, are by this attention destroyed.

The most formidable enemies to our Peach trees, are grub worms, pronounced by Mons. Bosc, director of the King's garden, at Paris, to be the larvæ of the *Callidia Flexuosa*. These insects attack the tree, at the surface of the ground, at the juncture of the bark which covers the trunk, and that which covers the roots, the larvæ feeding upon this tender bark, if not arrested in their progress, will, within a short time, make an incision entirely

around the tree, and in fact, ring it, making its destruction inevitable. The existence of these grubs in the bark, is always indicated by masses of gum exuding from the wound, and admonishes the cultivator, that no time is to be lost in removing the earth, and carefully picking them out with the point of some convenient instrument; the injured bark must be taken out to the healthy wood, and the wound covered with a mixture of old plastering, wood ashes, and fresh cow-dung; these are the ingredients of Forsyth's celebrated composition, though not the proportions, which I think unimportant, believing as I do, that all compositions that will not injure a tree derive their value, more from their tendency to exclude the influence of the atmosphere, than any abstract healing quality they may possess.

Having stated the process by which the mischief may be arrested, I shall detail the various means that have been devised for preventing it. Our great Creator in his provision for the pro-creation of the living species, has endowed each animal with an instinct to conform to certain laws of organization which he established, when beings were called into existence, and those relating to insects are not the least curious; an insect must assume three distinct characters, before it arrives at what may be termed its perfection. The first is, the egg laid by the parent, and the duty now devolves upon her simply to place it in a situation most favourable to its production, and for access to proper food by its progeny; some place it in putridity, as the common house fly; others envelope it in earth, without any visible access to food, as the Beetle and Wasp tribes; the Bees encircle theirs in small cells of wax; some deposit their eggs in the tender fruit, as the *Curculio*, and so general appears to be this transmigration, (for there are some exceptions, particularly in the tribe of Spiders) that the very mites we see in cheese, are but the probationary state of more perfect beings. Insects having thus disposed of their eggs, leave the rest to the simple operations of nature. In process of time, the eggs produce worms of a voracious character, exemplified by the Silk-worm, and in sustaining themselves, generally destroy that which produces their food, for the ravages made by the caterpillar upon the Mulberry, Persimon and Cherry trees, must be familiar to all; from this state it passes into that of a chrysalis, shewing

no symptoms of life, but occasional motion, it remains for some time in a dormant state, without food, and then emerges into light and life, the perfect insect armed with its natural instinct like the Silkworm and Bee, to minister to the luxury of man, or like the Locust, and many of that character, to blast and destroy the hopes of the husbandman. The *Callidia Flexuosa*, selects that portion of the Peach tree I have mentioned, in which to secure its progeny. They counteract the evil in New-Jersey by opening the roots of the trees in Spring, and putting rotten fish around them; the late Mr. Parmentier, who was a very extensive cultivator of fruit trees, says, "that a gentleman purchased four Peach trees from him, he placed coal ashes around two of them, which were preserved, whilst the two others were destroyed," and that the above means receive confirmation in France and in England, where they use coal-soot, as well as that of wood to destroy the grub. The inroad of this insect may be resisted by tying straw around the trunk of the tree to the juncture with the roots, which prevents the insect from getting access to that part of the tree necessary for its purpose, or if it should, near the spot, the eggs will be thrown out by the oozing of the gum from the bark and destroyed by exposure. This expedient must be resorted to from May until August.

PERSICO.

(To be Continued.)

Queries as to the application of Gypsum, as a Manure.

"Mobile, February 2, 1835.

To the Editor of the Southern Agriculturist.

Sir,—Our midling and lighter qualities of cotton lands are rapidly wearing out, and a knowledge of the best means of restoring their fertility is a great desideratum. I have seen no mention made of the application of *Gypsum*, as a manure, in any of the Southern States. If any of your correspondents have made experiments with it, a call from you would elicit the result. It is generally believed, that near the sea-board it has no efficacy, but in the interior, it might be found beneficial.

Would it not be worth while for our intelligent upland planters to attend to this?

J.

PART II.

SELECTIONS.

On Chemistry, as connected with the developement and growth of Plants.

By the Author of the Domestic Gardeners' Manual; in a series of numbers, published in the London Horticultural Register.

ARTICLE THREE.

Atmospheric Air.—Wherever we turn our eyes, to whatever natural phenomena we direct our attention, wonders present themselves, stupendous combinations overwhelm the mind with astonishment, and "give us pause."

In my last chemical paper, I endeavoured to attract the readers' curiosity, and fix it upon an inquiry into the nature and properties of *water*. The order in which the natural agents arrange themselves, leads us now to the immediate consideration of the *Atmosphere*, that elastic, invible fluid, which, though its effects upon vegetables may not be so palpable as are those of the *liquid* element, must be as vitally influential of the due and healthy performance of their several functions, as it manifestly is indispensable to the very existence of the animal creation. But what is *Air?* is it, in fact,—as was sacredly believed at no very remote period, a simple element, one of "the four," or is it not?

Let us have recourse to experiment—and in the first place, let us pay the just tribute of respect due to the great Lavoisier, and adduce his important, his conclusive discovery.

As it will be impossible to present a drawing of the apparatus employed by the operator, I must be content to state the materials employed, and the final results, in general terms, referring the reader to Vol i. pages 82 and 3, of the fifth edition of the "*Elements of Chemistry.*" Four ounces of quicksilver were introduced into a glass-matrass or retort, the beak of which passed through a body of the same fluid metal, into a bell-glass receiver. These two vessels contained about fifty cubical inches of atmospheric air. "Having accurately noted the height of the thermometer and barometer," (I quoted the exact words) "I lighted a fire in the furnace" (upon this furnace the retort was placed, and reference is here given to an engraving,) "which I kept up almost continually during twelve days, so as to keep the quicksilver always very near its boiling point. Nothing remarkable took place during the first day: the mercury, though not boiling was continually evaporating, and covered the interior surface of the vessel with small drops, which gradually augmenting to a sufficient size, fell back into the mass at the bottom of the vessel. On the second day, *small*

red particles began to appear on the surface of the mercury: these, during the four or five following days, gradually increased in size and number, after which they ceased to increase in either respect. At the end of twelve days, seeing the calcination of the mercury did not at all increase, I extinguished the fire, and allowed the vessels to cool." The bulk of air in the body and neck of the matrass, and in the bell-glass, at the same medium height of the barometer and thermometer as at the commencement of the experiment, was reduced from fifty cubical inches to something between forty-two and forty-three cubical inches; "consequently it had lost about one-sixth of its bulk. Afterwards, having collected all the red particles from the running mercury in which they floated, I found these to amount to forty-five grains."

This experiment was several times repeated to attain assured accuracy; this being effected, "the air," he adds, "which remained after the calcination of the mercury in this experiment, and which was reduced to five-sixths of its former bulk, was no longer fit either for respiration or for combustion: animals being introduced into it were *suffocated in a few seconds*, and when a taper was plunged into it, it *was extinguished* as if had been immersed in water."

This is no fanciful experiment, it is not one of mere science, performed by a gentleman in his private laboratory. With some modifications it is, and has long been, repeated by the operative chemist, for the production of one of the most energetic preparations of mercury, add (the *red oxide*, or *Mercurius calcinatus.)* The late Sir H. Davy, states in few words that follow the converse of the experiment just adduced.

"To procure pure oxygen from air, quicksilver may be kept heated in it, at about 600 degrees till it becomes a red powder: this powder when ignited, will be restored to the state of quicksilver by giving off oxygen."—*Agricul. Sects. p.* 194. *Edit.* 4.

That the reader may acquire some idea of the chemical changes effected by these processes, I add the mercury in the vessel, subjected for many days to a high temperature, is acted upon by a portion of the atmospheric air within the vessel. It gradually loses its metallic appearance, and certain portions of it acquire a red colour and crystalline figure. These red particles are heavier than the portion of mercury which has disappeared: for if the remaining metal, and the red particles be weighed, they will be found to exceed in weight that of the mercury originally employed; and if the air remaining in the vessels be also correctly weighed, it will be found to have lost in weight exactly as much as the red particles of the preparation have acquired.

These red particles (as Davy asserted, and Lavoisier's experiment had in its completion clearly demonstrated,) will give forth by the agency of heat, that portion of the air, which they had attracted. The air of the atmosphere is thus proved to be composed of two æriform fluids or gases at the least; and by a variety of well conducted experiments, chemists have arrived at the conclusion that, the non-respirable part exists in the proportion of about 79 in every 100 parts of air. The remaining 21 parts consist of a gas which is not only respirable, but capable of supporting combustion in a very eminent degree. In my first paper, I alluded to both these gases; to the former under the terms of azot or nitrogen, and to the latter, under that of oxygen.

How the agency of fire may be exerted so as to cause, first, the attraction and fixation of the oxygen, or vital principle of the air; and second, its separation and expulsion from the red oxide, the formation of which

it had previously induced, is one of those mighty secrets, which the human mind may, perhaps, never be permitted to fathom. Nature affords irrefragable evidence of the all prevailing, all actuating principle of elementary fire, a principle that can alone be rationally referred to the Sun. I cannot, however, dwell now upon any inquiry into the facts that give substance to the hypothesis which, I fear has been of late, but too little investigated. The subject will be resumed when I come to consider the phenomena of light, heat, and electricity. As few readers can be supposed to possess an apparatus, by which they may bring the foregoing experiments to the test, I shall mention another, far more simple and of easy performance, that may afford some ready proof of the compound, decomposable, nature of atmospheric air.

Pour a quantity of water into a flat dish, let a small saucer containing a little lamp oil, and a cotton wick be made to float on the water; by the side of the saucer fix a stand of any sort that can support a piece of wax taper, so that its wick may rise two or three inches above that of the lamp, then adapt a tall bell-glass to the dish, large enough to permit it to cover the saucer and taper, and to leave a space of an inch or more between them and the glass. The height of the bell ought to be such as to leave six inches clear space above the taller wick. The apparatus being thus prepared, light the two wicks, cut each of them, if needful, till the flames appear well defined and without smoke, and then invert the bell-glass over both. Its lower edge will now be immersed in the water of the dish, and thus, air will be entirely excluded. For a time, each will emit its usual light, and at first will produce expansion of the air within, so that the operator ought to press gently, but steadily, upon the top of the glass to keep it from falling, with his hand guarded by a cloth, to prevent accident in case of a sudden fracture. By the attractive energy exerted between the combustible bodies, and the supporting principle of the air, (the oxygen gas,) all, or the greater part of the latter will be separated from the other component gas, and unite with the components of the cotton, oil, and wax. Water and some carbonic acid will be formed; the former will be deposited chiefly in the dish, and the latter will also, in part, combine with the water, as that fluid and carbonic acid have some affinity for each other. In proportion as the supporting principle is withdrawn, the flames of the wicks will grow smaller, but that of the taper will, in most instances, be first extinguished, owing to the superior weight of the purer air. As, however, carbonic acid is still heavier, the quantity produced by the taper may perhaps descend, and put out the flame of the lamp. When both have expired, it will be evident that, the air remaining in the bell-glass can no longer be capable of supporting combustion; it therefore has been deprived of one of the essential qualities of pure atmospheric air; and that it has been so deprived, will be ascertained by another concomitant proof; for there will be an absorption of water as soon as the air within shall become somewhat cool. In other words, the external air, pressing by its incumbent weight upon the surface of the water in the dish, will force a portion of it into the bell-glass; and as therein, it will meet with diminished resistance, owing to the abstraction of the oxygen, the water will make its mark at a level above the one at which it stood at the commencement of the experiment. If both their levels were marked, and the total capacity of the bell-glass ascertained by filling it with water, a comparison might easily be made between the total bulk, and that of the air consumed. In experiments of the above nature, great accuracy, however, must

not be expected, but they suffice to evince that a considerable portion of the air has been abstracted. The Azot remaining, could not be breathed; it would be fatal to any small animal. Its nature, however, has for the present been sufficiently described; and with respect to the oxygen, I refer the horticultural reader to an experiment for its production more pleasing and germain to his profession, which he will find by reperusing the 2d, 3d and 4th paragraphs in page 91, of the article upon *water*, in the *Southern Agriculturist*.

I shall have occasion to revert to this experiment again, as involving phenomena connected with the agency of solar light.

Azot is lighter than atmospheric air, and still more so than oxygen gas.

The specific gravity of the last is about 1,1. That of azot about ,983 decimal parts, taking atmospheric air as the standard of unity, or at 1,000. One hundred cubical inches of azotic gas, according to Henry's table, weigh about 30,5 grains (30½,)

The foregoing chemical facts are not new; they are, or may be, familiarly known to every practical and reading chemist; I therefore lay claim to nothing approaching to discovery in all that I have as yet adverted to. But I do not write for chemists: my object is to introduce the young gardener to the knowledge of a few leading principles, and thereby to rouse a spirit of inquiry, a love of reading, and above all, a determination to reason, reflect, and draw conclusions by his own mental powers, uninfluenced by servile deference to the dicta of authority.

Chemists are nearly agreed in the proportions they assign to the two essential components of air, *Azot and Oxygen*; but they are at variance in respect to the volume of other fluids which are found to exist in it. Carbonic acid is one of these fluids, and it is estimated by Davy that, in places where there is a free circulation of air, it is probably never more than $\frac{1}{500}$ nor less than $\frac{1}{800}$ of the volume of the air.

Upon the composition of this gas, formerly known by the terms *aërial acid*, and fixed air, he observes, that if thirteen grains of well burnt charcoal be inflamed by a burning-glass, in one hundred cubical inches of oxygen gas, the charcoal will entirely disappear; and provided the experiment be correctly made, all the oxygen except a few cubical inches, will be found converted into carbonic acid; and, what is very remarkable, the volume of gas is not changed. On this last circumstance, it is easy to found a correct estimation of the quantity of pure charcoal and oxygen in carbonic acid gas; the weight of one hundred cubical inches, is to that of one hundred cubical inches of oxygen gas as forty-seven to thirty-four; so that forty-seven parts in weight of carbonic acid gas must be composed of thirty-four parts of oxygen, and thirteen of charcoal." (See 5th Agricultural Lecture.) Now by Henry's table, upon the authority of Kirwan, one hundred cubical inches of oxygen gas weigh thirty-four grains: hence, if the one hundred inches be attracted during the combustion of thirteen grains of charcoal, and united therewith, the result must be about forty-seven grains of carbonic acid gas, and this was the fact to be demonstrated. Carbonic acid derives its name from the Latin word *Carbo*, (see Vol. 2, page 437,) and from the combination of that base, with the supposed *acid*, producing agent, oxygen, (ib. page 436.) It is soluble in water to perhaps, the extent of rather more than the bulk of that liquid to which it then communicates acid qualities. In its

free state. it exists in the form of gas; but it is attracted, and fixed in the solid form, by many chemical bases, by lime particularly, which it renders mild. This mild lime is chalk, chemically termed *carbonate of lime:* the facts connected with carbonic acid as a vegetable aliment, will come under notice in a future article.

Another substance is traceable in atmospheric air, as one of its apparent components; though chemists generally consider Azot and Oxygen to be the sole essential constituents of true respirable air. Water is stated to exist in the form of vapour at all times, but in varying proportions, according to the temperature of the atmospheric volume.

I have spoken at some length upon the chemical nature of water in my second article, but much remains to be said when that fluid is viewed in connection with the constitution of atmospheric air; and I request the reader to bend all his attention to the following facts, for they are of stupendous moment. There are, as might be expected, a great variety of opinions concerning the comparative quantity of watery vapour in the atmosphere: at fifty degrees, Davy states it to be about $\frac{1}{50}$ of the bulk of the whole, but as the specific gravity of vapour is to that of air as ten is to fifteen, the weight of vapour is only $\frac{1}{75\text{th}}$ part. The average temperature of day and night throughout the year, may perhaps somewhat exceed fifty degrees; therefore, if we admit that a greater volume of vapour is raised during a warm state of the atmosphere than when the temperature is low, we may suppose that the quantity exceeds, upon an average, that above noted. Some, however, have considered one part in one hundred to be a fair estimate of the amount of vapour held in solution, or that it varies from $\frac{1}{80\text{th}}$ to $\frac{1}{100\text{th}}$ part.

The subject involves phenomena of far greater moment: it points to the origin and source of the atmosphere itself. Whence was the aerial volume derived, and what supports and renews it? for the consumption or degradation of the fluid by the processes of animal respiration, and natural fermentation are of enormous extent!

Dr. Priestly and Sir Humphrey Davy, at periods very remote in point of time, witnessed phenomena in regard to azot nitrogen, which gave reason to suppose that, that gas was not simple, or uncompounded in its nature. The latter chemist conjectured in fact, that he had decomposed it, and that it might be an oxide of hydrogen.

I stated, several years past, that I believed this to be the fact; and I then embodied my ideas in the form of the following atmospheric theory.

"The atmosphere was originally formed out of, and is daily renewed by vapours raised from the surface of the earth and waters, by the agency of solar induction and decomposition; that it is therefore, composed of the elements of water in a new and peculiar arrangement, effected by the energy of specific electro-chemical agencies."

I believe that the idea of the aqueous origin of air was once entertained; but that it was relinquished as untenable, or silently abandoned —to use a familiar phrase—as out of fashion. I claim as my own exclusive hypothesis, that of the inductive agency of light in this vast process; and I therefore am called upon to state the evidences upon which I ground my opinion.

The first is afforded by the phenomenon of evaporation. The experiments of Dr. Halley, the celebrated astronomer, led him to the calculation, that as one cubic inch evaporated from every ten square inches of the surface of the sea in twenty-four hours, a square mile of surface would evaporate daily 6914 tons. The Mediterranean sea was supposed to lose, each day, 5280 millions of tons; and Dr. Thompson was led to infer, that the average volume of water raised from the whole surface of the earth, amounts annually to ninety-four thousand, four hundred and fifty cubic miles.

Now all this may be very wild and visionary, but the learned Bishop of Llandaff, Dr. Watson, founded his calculations upon more familiar experiments, and he thence arrived at the conclusions which I proceed to state. He placed glass vessels of known capacity upon the surface of the ground, when that was in very different state of dryness; and found that even in periods of drought, under a burning sun, the quantity of vapour yielded was prodigious. He estimated the quantity of pure water yielded by a single meadow of an acre's surface in twenty-four hours, to be equal to 1600 gallons.

Two-thirds of this inconceivable volume of water, which, be it recollected, if reduced to a state of vapour, must occupy fully 1400 times the original bulk of the liquid—two-thirds of this volume are supposed to be precipitated in the form of rain. A portion also may be condensed as dew, but what becomes of the remainder of the vaporised water? I suggest the reply, fearless of any conclusively philosophical refutation, that it is converted by solar electric agency into the pure respirable air of the atmosphere, whose volume it thus replenishes and maintains in its integrity.

To corroborate this hypothesis, which by most, may perhaps be denounced as fanciful, and utterly devoid of foundation, I appeal to the following phenomena.

1. *Phenomena of Vapour and Steam.*

The production of vapour is now admitted to be attended with electricity; it is in fact, a process of developement by the agency of heat, or combustion, whereby the particles of water are separated, and kept apart, by a repulsive power. If steam be projected into the air from a boiling vessel, or even from the lungs, by forcible expiration, it assumes various forms, according to the existing state of the atmosphere. If that be cold and damp, the vapour remains distinctly visible for some seconds; yet even in such a state, when also, the concomitant of a fog or mist affords proof of the abundance of atmospheric humidity, the steam rolls about, disperses, and is lost, amidst the accumulated vapour. If, on the contrary, the atmosphere be dry, and buoyant, (be the temperature what it may,) the steam rises, expands, breaks off, into light, irregular masses, and speedily disappears. Every action, every form it assumes, denotes repulsion and attenuation, not combination, nor attraction. The vapour is taken up into the mass of clear air, and becomes an integrant part of it.

The same thing occurs, though upon a grander scale, with those stratified mists, which, in summer and autumn, afford proof of, and precede, a clear and settled state of weather. The morning which comes attended with one vast and dense haze, is gradually relieved by the agency of solar light; the vapours break, form into masses, and roll away, till they vanish into air, and leave the sky cloudless, and under the dominion of a powerful and burning sun. The same vapour under a different modification, is frequently the precursor of a

thunder storm. Instead of vanishing, it is formed into vast cumuli, which, bearing different electric relations with other cumuli, or with a portion of the earth's surface, emit when within the sphere of mutual attraction, flashes of fire, and effect the decomposition, and in the next instant, the re-formation of the watery particles. The reader who has witnessed the stricking effect produced by throwing a certain portion of water upon a large mass of burning coals, ignited to almost a white heat, may readily imagine a case of the sudden developement of the constituents, (oxygen and hydrogen gases,) and at their instant re-union, attended with a most tremenduous explosion. The phenomenon is not far remote from the one under consideration.

I proceed to notice other natural facts which tend to prove the conversion of vapour into atmospheric air, these are to be found

2. In *the Phenomena of Hoar-Frost and Snow.*

Whoever is attached to meterological observation, can scarcely fail to recollect the singular disappearance of those concomitants of winter. A mist or stratus, at times accompanies severe frosts; in this case, the whole surface of the ground, every blade of grass, every twig, is covered with frosts speculæ: a tree, a mass of trees particularly, presents a splendid spectacle, every portion of the spray is studded with crystals of dazzling whiteness. Under these circumstances, the hazy mist alone being removed—in a state of perfect calm, without any particular change in the temperature, without thawing, or any visible solution of the particles, the whole of the rime shall disappear, vanish, and be taken up by the air. A body of snow also, is frequently seen to dwindle away without any abatement of frost, or dispersion by the force of wind.

During the operation of these silent attractions, millions of cubic feet of crystallized water (such at least, these meteors are believed to be) are taken up into the aerial volume, and wholly disappear! In some instances, these phenomena are followed by rain, and then, it is reasonably supposed that, the vapours thus assumed, are not decomposed; but in other instances, the atmosphere brightens, the barometer rises, and the weather becomes settled. This state of things leads to the consideration of

3. *The Phenomena of Atmospheric pressure.*

But here I must conclude, for I have so far extended my limits that, I postpone the consideration of the interesting facts which remain to be adduced, till I again address your readers in my fourth chemical article.

January 11*th*, 1834.

Vegetable Physiology in relation to Rotation of Crops; by M. Macaire.

[Translated for the Journal of Science and Arts, by Professor Griscom.]

The *New-York Farmer* says—"Those who have a taste for Science, will peruse the following article with deep interest. The doctrine advanced is, in a measure, new, but yet supported by experiment."

In a memoir inserted in the transactions of the *Societe de Physique et d'Histoire Naturelle*, of Geneva, this gentleman has developed some physiological facts, interesting to science and to practical agriculture.

A judicious rotation of crops is known to be a matter of great importance. One kind of vegetable (A) will grow and flourish well in a

soil from which another kind of vegetable (B) has just been gathered, while an attempt to raise another crop of the first vegetable (A), or a crop of a third vegetable (C), immediately after the first (A), in the same soil, will be attended with little or no success. The discovery of this fact, which is almost as ancient as agriculture itself, is supposed to have led to the practice of fallowing. A piece of fallow ground will, almost to a certainty, be covered with a crop of weeds. These being plants of a different nature do not unfit the soil, but prepare it for a succession of the same crop as that which preceded them. But science or experience has taught the enlightened farmer to substitute useful plants in the room of weeds, and thus to keep his grounds in profitable activity.

Various reasonings have been employed to account for the necessity of this rotation. 1st. That different plants absorb different juices from the same soil, and that a piece of ground exhausted by culture, may still be rich for another class of vegetables. But it is known to physiologists, that plants absorb all the soluble substances that the soil contains, whether injurious to their growth or not. 2d. That the roots of different plants being of different lengths, extend in different layers of the soil, and thus derive from it appropriate nourishment. But the roots of all plants, at the period of germination, must be in the same stratum, and of course be equally dependent upon it; and besides the culture of the farmer turns up and mixes the various layers of the soil together, so as to render them, in all probability, homogenous. It is known also that plants of the same family, such as clover (trefle) and lucerne do not prosper in succession, although their roots are of very different lengths.

The true explanation of the necessity of rotation, appears to be founded on the fact stated by Brugmans, and more fully exposed by De Candolle, that a certain portion of juices which are absorbed by the roots of plants, are, after the salutiferous portions have been extracted by the vessels of the plant, again thrown out by exudation, from the roots, and deposited in the soil. It is, probably, the existence of this exuded matter, which may be regarded, in some measure, as the excrement of the preceding crop of vegetables, that proves injurious to a succeeding vegetation. It has been compared to an attempt to feed animals upon their own excrements. The particles which have been deleterious to one tribe of plants cannot but prove injurious to plants of the same kind, and probably to those of some other kinds, while they may furnish nutriment to another order of vegetables.*

The author endeavoured to subject these theoretic views to experiment. After various attempts to raise plants in pure silicious sand, pounded glass, washed sponge, white linen, &c., he decided upon pure rain water. After cleansing and washing the roots thoroughly, he placed them in phials with a certain quantity of pure water. After they had put forth leaves, expanded their flowers and flourished some time, he ascertained by the evaporation of the water, and the use of chemical re-agents, that the water contained matter which had exuded from the roots. He satisfied himself that this is the fact with respect to nearly all the phanerogemous plants.

* I have been assured by farmers, of a fact somewhat analogous in relation to animals. Hay which has been left in the manger of a horse, or which has otherwise received the impregnations of his breath, will not be touched by another horse, but will be freely eaten by cows or sheep.—G.

Several plants of Chrondrilla Muralis, perfectly clean, were placed with their roots in pure water. At the end of a week, the water was yellowish and emitted an odor like opium, and had a bitter taste. Sub-acetate and acetate of lead produced a brownish flocculent precitate, and a solution of gelatine disturbed its transparency. As a proof that this matter was the result of excretion from the roots, it was found, that neither pieces of the root nor of the stem, when macerated in the water during the same, occasioned either taste, smell, or precipitate.

To determinate at what period, whether night or day, this discharge from the roots takes place, a plant of common bean, [Phaseolus Vulgaris] was carefully cleaned, placed in rain water and kept a week, during the day time in one vessel, and during the night in another, being well wiped at each transfer. In both fluids were evident marks of excretion from the roots, but that in which the roots were immersed during the night contained a very notable excess of the transpired matter. Numerous other experiments gave the same result. As it was well known that the light of day causes the roots to absorb their juices, it is natural to suppose that during the night absorption ceases and excretion takes place.

To prove that the plants employ [if we may so speak] the excretory powers of their roots in order to get rid of hurtful substances which they may have imbibed, the following experiments were made. Some plants of Mercurialis annua, were well washed in distilled water, and placed so that one portion of their roots dipped into a weak solution of acetate of lead, and another branch of the same root into pure water. Having vegetated in this manner very well for several days, the water was tested by hydro-sulphuret of ammonia, which proved, by the black precipitate which it formed, that a notable portion of the lead had been absorbed, and deposited by the branch which dipped in the pure water. Groundsel, cabbage, and other plants, gave the same result. Some plants grew very well for two days in acetate of lead. They were then withdrawn, their roots well washed with distilled water, carefully wiped, again washed in distilled water [which being afterwards tested was found to contain no lead,] and then placed to vegetate in a vessel of rain water. In the course of two days, this water was found to contain a small quantity of acetate of lead.

The same experiments were made with lime water, which, being less injurious to plants, is preferable to lead. The roots being partly placed in pure water, the plants lived well, and the pure water soon showed the presence of lime by oxalate of ammonia; and plants which had grown in lime, and then transferred with every precaution to pure water, soon disgorged into it a portion of lime.

Similar trials were made with a weak solution of marine salt, and with a like result. Learning from M. de Candolle that marine plants, when transplanted in a healthy situation, frequently grow well at a distance from the sea, and that in such cases the soil in which they grow contains more salt than the surrounding soil, the author endeavoured to imitate nature by taking a few common plants, placing their roots in rain water, and wetting their leaves with a solution of marine salt. None of the salt was discovered in the water; and it may therefore be inferred, either that the solutions of salt cannot imitate the delicate process of nature, or perhaps more probably that soda plants

alone have the power of absorbing by their leaves marine salt, and rejecting a portion of it by their roots.

There can be no doubt, then, that plants have the power of rejecting by their roots soluble salts which are injurious to vegetation. The author gives a few interesting details of experiments on some particular families of plants.

Leguminous Plants.—The only plants which he tried of this family were peas and beans. They live and grow well in pure water. After some time, the liquid being examined, has no sensible taste—its smell is faintly herbaceous. It is quite clear and almost colourless in the case of kidney beans, [haricots] more yellow in peas and common beans, [feves.] The fluid when examined by chemical tests, evaporation, &c., is found to contain a matter very analogous to gum and a little carbonate of lime.

It was found that when the water in which these plants had lived was pretty well charged with this excrementitious matter, fresh plants of the species soon withered in it and did not live well. To ascertain whether this is for want of carbonic acid in the fluid, [which plants derive from the earth as from the air, or from the presence of the excreted matter, which they repudiated,] the author put the fluid of some plants of another family, and especially wheat. This lived well, the yellow colour of the fluid became less intense, the residuum less considerable, and it was evident that the new plant absorbed a portion of the matter discharged by the first. It was a kind of rotation experiment performed in a bottle, and the result tends to confirm the theory of De Candolle. It is not impossible that by experiments of this kind, results may be obtained of practical importance to agriculture. The author would infer that wheat may follow with great advantage a crop of beans.

Gramineous Plants.—Wheat, rye, and barley were examined. They do not grow well in rain water, probably from the noteable quantity of mineral substances, especially silex, which they contain, and which they cannot derive from pure water. The water in which they have vegetated is clear, transparent, without colour, smell or taste. It contains some salts, alkaline and earthy muriates and carbonates, and only a very small portion of gummy matter. He thinks these plants reject scarcely any thing but the saline matters, foreign to vegetation.

Chicoraceous Plants.—The Ghrondrilla murialis and the Sonchus oleraceus live very well in rain water. The latter acquires a clear yellow colour, a strong smell, and bitter taste. Treated with tests, and concentrated by evaporation, it is found to contain tannin, a brown gummy extractive substance, and some salts.

Papaveraceous Plants.—Plants of field poppy [Papaver Rhœas,] will not live in rain water; they speedily fade. The white poppy [Papaver Somniferum,] lives very well. The roots produce a yellow colour, a vinous odor, a bitter taste, and the brownish residuum might be taken for opium. This plant is one of those which neither the roots nor the stems cut into pieces and steeped into water, produce in it any of the changes which the growing plants communicate.

Euphorbiaceous Plants.—The Euphorbia cyparisias and E. peplus, are the plants, from whose roots Brugmans observed the exudation of drops during the night. The author has not been able to verify this fact by direct observation. The plants vegetate well in rain water, giving a very strong and persisting odor. Boiling alcohol dissolves the resi-

duum, and deposits by evaporation a granular, gummy resinous, yellowish white, very acrid substance, leaving a strong after taste.

Solanaceous Plants.—The only plant of this family which I have tried in water is the potato. It lives well in rain water, and puts forth its leaves. The water is scarcely coloured, leaves little residuum, gives but little taste, which induces the belief this is one of the plants whose roots secrete little or nothing of a decided character. This, however, is the result of only a single hasty experiment, made upon a plant at an early stage of its developement.

The inferences which the author deduces from his experiments (acknowledging, however, that more extended trials on a greater number of families and individuals are desirable,) are, 1st. That the greater number of vegetables exude by their roots substances unfit for their vegetation. 2d. That the nature of those substances varies according to the families of the plants which produce them. 3d. That some being acrid and resinous may be injurious, and others being mild and gummy, may assist in the nourishment of other plants. 4th That these facts tend to confirm the theory of rotation due to M. De Candole.—*Bib. Univ. Mai.* 1833.

On the Corn Crop.

[From the proceedings of the New-York State Agricultural Society.]

By J. BUEL.—*From the Cultivator.*

THERE is no crop more beneficial to the American farmer than Indian corn. An eminent agriculturist, the late John Taylor of Virginia, called it the "meal, meadow and manure," of the farm. It is convertible into human food in more forms than any other grain; its value in fattening domestic animals is not exceeded by any product of the farm; and no crop returns more to the soil than this does in the form of manure. There are two important requisites, however, to its *profitable* cultivation. The first is, that the soil, be adapted to its growth; and the second, that the crop be well fed and well tended; for food and attention are as important to the plant as to the animal. Ordinarily speaking, it costs less to take care of a good crop of corn, on proper corn land, than it does of a bad crop on land not adapted to its culture. The first is light and dry. The latter stiff, wet or grassy. I put the average expense of cultivating and securing an acre at $15, *(a)* including a fair rent, though it ordinarily exceeds this sum. The farmer, therefore, who obtains thirty bushels from the acre, estimating the grain at 50 cents per bushel, gets a fair compensation for his labour, and the use of his land. Whatever the product falls short of this, is an absolute loss; and whatever it may exceed, it is nett gain. Thus the man who gets but twenty bushels from the acre, loses upon

(a) Estimated expense of cultivating an acre of Indian corn:

One ploughing, (suppose a clover lay,)	$2 00
Harrowing and planting,	2 00
Two hoeings, 4 days and horse team,	3 75
Harvesting, 2 days,	1 50
Cutting and harvesting stalks,	1 50
Rent,	5 00
	—$15 75

this estimate, $20 worth of his labour, on four acres. He who raises 80 bushels to an acre, on the other hand, realizes a nett profit of $100 from four acres—making a difference in the profits of the two farmers in the management of four acres of corn, *one hundred and twenty dollars!* These data are sufficiently accurate to show the importance of the two requisites I have suggested, and the value of a little calculation in the business of farming. The habit of noting down the expense, as well as the product of a crop, and thus ascertaining the relative profit and loss, is highly advantageous to the practical farmer, and one which cannot be too strenuously inculcated. It will, perhaps, be said, that I ought to add the value of the manure which is employed in the large crop; but I reply, that I offset this against the increased forage which this crop furnishes. Besides, by applying the manure in the unfermented state in which it is generally found in the spring, it will be as beneficial to the succeeding crops, as though it had lain and fermented in the yard, and been applied in the usual way in the autumn. *(b)*

The soils adapted to the culture of Indian corn, are such as are permeable to heat, air, *(c)* and the roots of the plant, and embrace those denominated sandy, gravelly and loamy. Corn will not succeed well on grounds that are stiff, hard or wet. The roots grow to as great length as the stalks, and the soil must be loose to permit their free extension.

The manures used are generally yard and stable dung, and plaster of Paris, *(sulphate of lime.)* The first ought to be abundant; as upon the fertility which it induces, depends the profit of the crop. Long or unfermented manure is to be preferred. It decomposes as the wants of the plant require it; while its mechanical operation, in rendering the soil light and porous, is beneficial to the crop. It should be equally spread over the whole surface, before it is ploughed under. It then continues to afford fresh pasture to the roots till the corn has manured, and is in its place to benefit the succeeding crop. If put into the hills, the roots soon extend beyond its influence, it does not so readily decompose, and the subsequent crop is prejudiced from its partial distribution in the soil. In a rotation of four or five years, in which this crop receives the manure, twenty-five or thirty ordinary

(b) Stable and yard manures lose 50 per cent. by the fermentation they undergo in the yard during the summer. This loss consists of the gases which are evolved in the process of rotting, and of the fluids which sink into the earth, or are carried off by the rains. Plants receive their food either in the gaseous or liquid form. If manure rots in the soil, neither these gases or fluids are lost: the earth retains, and the roots of the plants imbibe them. Yet recent manures are not proper to be applied in small grains. They cause too rank a growth of straw, and are apt to induce rust and mildew. Thus a crop of corn, potatoes, or ruta baga may be *fed* and *fattened*, if I may use the expression, upon the dung which is destined to nourish the wheat crop, without deteriorating its value for the latter purpose, if it is applied to the corn, &c., before it has fermented.

(c) We are on the northern border of the maize zone, and should make up for the defect in climate by selecting soils into which the heat readily penetrates. Air, besides conveying warmth in summer, imparts fertility by the vegetable food which is always suspended in it in the form of gases. Dews are also charged with these properties of vegetable nutriment, and when the soil is porous, they settle down as in a sponge, and impart fertility to the roots (the true mouths) of plants.

loads may be applied to *one* acre with greater profit, than to *two* or *three* acres. Every addition tells in the product; and there is scarcely any danger of manuring too high for this favourite crop. Gypsum is applied broadcast before the last ploughing or harrowing, or strewed on the hills after hoeing. I pursued the first method, at the rate of a bushel to the acre. *(d)*

The best preparation for a corn crop is a clover or other grass lay, or lea, well covered with a long manure, recently spread, neatly ploughed, and harrowed lengthwise of the furrow. A roller may precede the harrow with advantage. The time of performing these operations depends upon the texture of soil, and the quality of the sod. If the first is inclining to clay, or the latter tough or of long continuance, the ploughing may be performed the preceding autumn; but where sand or gravel greatly preponderate, or the sod is light and tender, it is best performed in the spring, and as near to the planting as convenient. The harrow, at least, should immediately precede planting. All seeds do best when put into the fresh stirred mould. Stiff lands are ameliorated and broken down by fall ploughing; but light lands are rather prejudiced by it. When corn is preceded by a tilled crop, the ground should be furrowed, and the seed deposited in the bottoms of the furrows. Where there is a sod, the rows should be superficially marked, and the seed planted upon the surface. Where the field is flat, or the sub-soil retentive of moisture, the land should be laid in ridges, that excess of water which falls may pass off in the furrows.

The time of planting must vary in different districts and in different seasons. The ground should be sufficiently warmed by vernal heat to cause a speedy germination. Natural vegetation affords the best guide. My rule has been to plant when the apple is bursting its blossom buds, which has generally been between the 12th and 20th of May.

Preparation of the seed.—The enemies to be combatted are the wire worm, brown grub, birds and squirrels. Of these the first and two last prey upon the kernels, and against these tar offers a complete protection. I soak my seed twelve to twenty hours in *hot* water, in which is dissolved a few ounces of crude salt petre, and then add (say to eight quarts of seed) half a pint of tar, previously warmed and diluted with a quart of warm water. The mass is well stirred, the corn taken out, and as much plaster added as will adhere to the grain. This impregnates and partially coats the seed with the tar. The experience of

(d) I adopt the opinion of Davy, as to the *modus operandi* of plaster of Paris, that it forms a necessary constituent of plants which it benefits and is of no direct benefit to plants which do not afford it on analysis. Among the first are the clovers, corn, potatoes, and generally such plants as have broad and succulent leaves; while the latter embrace culmiferous grains and grasses, as wheat, rye, timothy, &c. Crititical observations for years has confirmed me in this conclusion. Gypsum must be rendered soluble before it can be taken up by the mouths of plants, and it requires 600 parts of water to dissolve one of this mineral. I infer from these facts, that by burying in the soil, it more readily dissolves, and is more accessible to the mouths of plants, than if spread upon the surface of the ground. I am induced, from these views of the subject, to sow plaster, on grass grounds, in March, and upon corn and potato grounds before the last ploughing for these crops. The latter was recommended and practised by the distinguished agriculturists, the late Mr. Taylor of Virginia, and Judge Peters, of Pennsylvania.

years will warrant me in confidently recommending this as a protection for the seed.

The manner of planting is ordinarily in hills, from two and a half to six feet apart, according to the variety of corn, the strength of the soil, and the fancy of the cultivator. The usual distance in my neighbourhood is three feet. Some, however, plant in drills of one, two and three rows, by which a greater crop is unquestionably obtained, though the expense of culture is somewhat increased. *(e)* *The quantity of seed* should be double, and may be quadruple *(f)* what is required to stand. It is well known that a great difference is manifested in the appearance of the plants. Some appear feeble and sickly, which the best nursing will not render productive. The expense of seed, and the labour of pulling up all but three or four of the strongest plants in a hill, it is believed will be amply remunerated by the increased product. If the seed is covered, as it should be, with fine mould only, and not too deep, we may, at least, calculate upon every hill or drill having its requisite number of plants.

(e) The following table exhibits the difference in product of various methods of planting, and serves also to explain the manner in which large crops of this grain have been obtained. I have assumed in the estimate, that each stock produces one ear of corn, and that the ears average one gill of shelled corn. This is estimating the product low; for while I am penning this (October) I find that my largest ears give two gills, and 100 fair ears half a bushel of shelled corn. The calculation is also predicated upon the supposition, there is no deficiency in the number of stocks, a contingency pretty sure on my method of planting.

		Hill	*bush.*	*qts.*
1	An acre in hills, 4 feet apart, each way, will produce, -	2722	42	16
2	The same, 3 by 3 feet, - - - - - - - -	4840	75	20
3	The same, 3 by 2 1-2 feet, - - - - - - -	5808	93	28
4	The same in drills, at 3 feet, plants 6 stalks, inch a part in the drills, - - - - - - -	29040	113	14
5	The same in drills, 2 rows in a drill, 6 inches a part, and the plants 9 inches and 3 feet 9 inches from centre of drills, thus, - - - - -	30970	120	31
	. . . .			
	. . . .			
6	The same in drills, three rows in a drill, as above, 3 feet from centre of drills	43500	170	5
	. . . . .			
	. . . . .			
	. . . . .			

The fifth mode I have tried. The ground was highly manured, the crop cleaned, and the entire acre gathered and weighed accurately, the same day. The product in ears was 103 baskets, each 84lbs. nett, and 65lbs. over. The last basket was shelled and measured, which showed a product on the acre of 118 bushels 10 quarts. I gathered at the rate of more than 100 bushels to the acre, from four rods planted in the third method, last summer; the result ascertained in the most accurate manner. Corn shrinks about 20 per cent. after it is cribbed. The sixth mode is the one by which the Messrs. Pratts, of Madison County, obtained the prodigious crop of 170 bushels per acre. These gentlemen, I am told, are of opinion, that the product of an acre may be increased to 200 bushels.

(f) I am told the Messrs. Pratts, above alluded to, used seven bushels of seed to the acre, the plants being subsequently reduced to the requisite number.

The after culture consists in keeping the soil loose and free from weeds, which is ordinarily accomplished by two dressings, and in thinning the plants, which latter may be done the first hoeing, or partially omitted till the last. The practice of ploughing among corn, and of making large hills, is justly getting into disrepute: for the plough bruises and cuts the roots of the plants, turn up the sod and manure to waste, and renders the crop more liable to suffer by drought. The first dressing should be performed as soon as the size of the plants will permit, and the best implement to precede the hoe is a corn harrow, adapted to the width of the rows, which every farmer can make. This will destroy most of the weeds and pulverize the soil. The second hoeing should be performed before or as soon as the tassels appear, and may be preceded by the corn harrow, a shallow furrow of the plough, or what is better than either, by the cultivator. *(g)* A slight earthing is beneficial, providing the earth is scraped from the surface, and the sod and manure not exposed. It will be found beneficial to run the harrow or cultivator a third, and even a fourth time, between the rows, to destroy weeds and loosen the surface, particularly if the season is dry. *(h)*

In harvesting the crop, one of three modes is adopted, viz: 1. The corn is cut at the surface of the ground, when the grain has become glazed, or hard upon the outside, put immediately into stooks, and when sufficiently dried, the corn and stalks are separated, and both secured. 2. The tops are taken off when the corn has become glazed, and the grain permitted to remain till October or November upon the buts. Or 3. Both corn and stalks are left standing till the grain has fully ripened, and the latter become dry, when both are secured. There are other modes, such as leaving the buts or entire stalks, in the field, after the grain is gathered; but these are so wasteful and slovenly as not to merit consideration. The stalks, blades and tops of corn, if well secured, are an excellent fodder for neat cattle. If cut, or cut and steamed, so that they can be readily masticated, they are superior to hay. Besides, their fertilizing properties, as a manure, are greatly augmented by being fed out in the cattle yard, and imbibing the urine and liquids which always there abound, and which are

(g) The cultivator is made in the form of a triangular harrow, with two bulls; or if intended to be graduated to different width, a centre bull is added, to which the exterior ones are attached by hinges. Iron slats, fixed to the exterior bulls, pass through a mortice in the centre one, perforated with holes, through which an iron pin passes to hold them at the graduated width. The teeth may be in any approved form, or reasonable number. The cultivator I use has five teeth, two in each of the outward, and one upon the centre timber. The teeth have a stout shank, with a duck's foot termination, four inches broad, somewhat cylindrical, rounded at the point, and inclined forward in an angle of 30 or 40°. This implement is used for other purposes; and may be used, like Beatson's, as a substitute for the plough, in preparing light soils for a crop. The handles are attached to the centrepiece. The teeth have a shoulder, on the under side of the timber, and are fastened with screws and nuts above.

(h) Some entertain a mistaken notion, that it is prejudicial to stir the soil among corn in dry weather, and others that weeds serve to prevent the evaporation of moisture by a hot sun. The reverse of these opinions is true. The exhaustion of moisture by a plant is in the ratio of the surface of its leaves and stocks presented to the sun and air.

lost to the farm, in ordinary yards, without an abundance of dry litter to take them up. By the first of these methods, the crop may be secured before the autumnal rains; the value of the fodder is increased, and the ground is cleared in time for a winter crop of wheat or rye. The second mode impairs the value of the forage, requires more labour, and does not increase the quantity, or improve the quality of the grain. The third mode requires the same labour as the first, *may* improve the quality of the grain, but must inevitably deteriorate the quality of the fodder. The corn cannot be husked too promptly after it is gathered from the field. If permitted to heat, the value of the grain is seriously impaired. *(i)*

Saving seed.—The fairest and soundest ears are either selected in the field, or at the time of husking, a few of the husks being left on, braided and preserved in an airy situation till wanted for use.

In making choice of sorts, the object should be to obtain the varieties which ripen early, and afford the greatest crop. I think these two properties are best combined in a twelve rowed kind which I obtained from Vermont some years ago, and which I called Dutton Corn, from the name of the gentleman from whom I received it. It is earlier than the common eight rowed yellow, or any other field variety I have seen, and at the same time gives the greatest product. I have invariably cut the crop in the first fourteen days of September, and once in the last week in August. The cob is large, but the grain is so compact upon it, that two bushels of sound ears have yielded five pecks of shelled grain, weighing 62lbs. the bushel.

In securing the fodder, precaution must be used. The buts become wet by standing on the ground, and if placed in large stacks, or in the barn, the moisture which they contain often induces fermentation and mouldness. To avoid this, I put them first in stacks so small, that the whole of the buts are exposed upon the outer surface; and when thoroughly dry they are to be taken to the barn, or left to be moved as they are wanted to be fed out—merely regarding the propriety of removing the whole stock at the same time.

(i) The leaves are the necessary organs for elaborating the food for plants, and when these are taken away the plant must cease to grow. The sap is useless until it undergoes elaboration in the leaves. Hence, when corn is topped in the usual way, the supply of food is cut off from the grain, except what may be elaborated in the husks. On comparing corn gathered by the first and second modes, it was the opinion of those who assisted in husking, that the first was soundest, brightest and heaviest. The third mode I have not tried. But it seems probable that the grain might acquire an increase of volume, though it would lose again by depredation and waste. The first method has these further advantages that it preserves the cob from being saturated with rain, and secures the fodder, when it is in its highest perfection and greatest quantity.

Lime, Ashes and Plaster for Corn.

[FROM THE TENNESSEE FARMER.]

Our readers will find below, an account of a large crop of corn raised by Mr. Semmes, of Maryland, the past season. The whole process pursued in the improvement of his land is not detailed, but we are led to understand, that the great product is in a considerable degree to be ascribed to the use of a mixture of plaster, and leached ashes. Hav-

ing ascertained the beneficial effects of this manure by repeated experiments, we feel ourselves well warranted in recommending the use of it to such of our readers as can procure it. Let leached ashes and plaster be mixed, in the proportion of two bushels of ashes to one of plaster, and let a small handfull of the mixture be dropped in each hill of corn, either before or after the corn is dropped, and covered with it, and the effect will be surprising, especially if a few rows are left in the field to which the manure is not applied, the difference will be visible and great throughout the season, and we doubt whether this mode of manuring corn in the hill, is not the cheapest, in proportion to the profit, of any which can be applied. We beg our readers to make the experiment, and to satisfy themselves. We have found unleached ashes equally good, when mixed with plaster in the same proportion. We have also found a similar application of slacked lime to each hill, highly advantageous, and would therefore recommend it, especially to those who cannot procure the plaster. The following is the account referred to.

Extract from the Journal of a gentleman who travelled for Agricultural information.

Nov. 1*st*, 1834.—Visited Mr. John Semmes, of St. Mary's county, Maryland, who informs us that his great crop of corn averaged upwards of twenty-five barrels the acre. Respectable judges of the county were appointed to ascertain the quantity of corn, and after having accurately surveyed one acre, the corn was gathered and measured. The farm is uncommonly hilly.

Process.—He prepares his ground by clover, the ground laid off from five by two and a half to three feet. The corn then dropped, three grains in the check, followed by persons who drop on the corn, or even if they are in advance of the corn-droppers, a handfull of two-thirds slacked ashes, and one-third plaster, mixed before it is dropped. Should the corn not come up regularly, he drops one or two seeds more, as may be necessary. He gathers his seed corn from the field before gathering the crop, so as to have a choice of ears. He plants from the 1st to the 10th of April, and ploughs four inches deep.

On the manner and time for sowing Clover Seed.

[FROM THE FARMER'S REGISTER.]

In consequence of my reading an ingenious article in the first volume of the Register, (page 566) on sowing clover seed, I was induced last spring to try one of the experiments therein recommended. Three beds, extending quite through a large field, were *harrowed* previously to their being sown. Two of them were rolled after the seed had been applied—the third not. Between these beds I observed no difference. I cannot therefore say whether or no the rolling would generally be of any use. Perhaps it may have been owing to the subsequent state of the weather, that no difference was perceptible. Theoretically, I should certainly prefer rolling, for the sake both of the wheat and the clover. Between the three beds, however, and the land on each side, there was a striking and gratifying difference during the whole year. They could be traced after harvest, with the eye, at the distance of several hundred yards, by their superior verdure and luxuriance, throughout their whole extent. A nearer inspection

showed that they were much more thickly set than the neighboring beds, on which the same quantity of seed had been put. The success of the experiment is as complete as can be inferred from a single trial: to me it is conclusive. I think an important consequence may be deduced from this plan, that did not occur to its author—I mean the estimated saving of one fourth of the usual quantity of seed, with greater certainty of success, and regularity of distribution, than in the common way with the more liberal allowance. It needs but little reflection to form some idea of the immense advantage that would thus result to an extensive region, for which nearly the whole supply of this article has to be purchased from a distance. The ordinary mode of sowing clover seed on a hard surface, and then leaving it uncovered to take its chance, is liable to many objections. Much seed is lost: it is irregularly distributed—the plants frequently growing in bunches, and not unfrequently failing altogether. But little land is so neatly prepared as not to have numerous inequalities. The seed is liable to roll, or be washed into the small cavities or depressions, while the eminences are either not at all, or only scantily supplied; and the few seeds that may remain and vegetate in those situations, are exposed to injury from drought or frost, or both. By previously harrowing, the seed sticks where it is deposited; and even if not rolled, it soon gets covered by the settling of the loose earth, from rain and other causes.

I have taken some pains to learn the opinions and practice of intelligent farmers, in regard to the management of clover seed. The result of these inquiries, briefly stated, may not be amiss. One gentleman, as remarkable for agricultural, as was a certain scourge of the Philistines of old for physical strength, prefers sowing in January: another, whose conclusions are not often wrong, the early part of February, which he considers so far preferable even to the latter part of the same month, as to justify one's paying, if necessary, double price for the seed: he mixes the requisite quantity of seed for each acre, with one bushel of damp saw dust; and plasters in the month of April, when the plants are well up. A third gentleman, who is very observant, and keeps an accurate diary, sows the clean seed from boxes, with small holes in different places to regulate the quantity, during a *cold* spell in February, or if it does not come in February, in March, (for he says it always will happen in one month or the other) and never applies the plaster till the second spring, in order to avoid the rust in his wheat, to which malady he thinks it is rendered more liable by the use of that mysterious mineral. The method of a fourth gentleman is to mix three bushels of plaster with one of seed, and to sow at first half the quantity intended to be applied, going over the whole ground, then returning to the place of commencement, and sowing the residue, so that the ground is twice sown over to insure greater regularity, and at two different periods, to afford a better opportunity of escaping destruction by frost; the full quantity of gypsum is afterwards applied when the clover plants get in the third leaf. The opinion of the writer of this article is in favor of sowing from the 25th of January till the 20th of February, taking all circumstances and seasons into consideration. By harrowing the land, and still better, I presume, by roling also, clover may doubtless be sown with perfect safety, considerably earlier and later than the period above specified. It may be useful here to state, that some sensible and successful farmers consider a bushel of plaster and ashes mixed in equal quantities,

as beneficial as a like measure of the former article alone, and of course, much cheaper, especially in the interior, where to the first cost of the commodity is to be added the cost of carriage.

A PLANTER OF THE LOWER JAMES.

January, 1835.

Manufacture of Oyster and Clam Shell Lime in the City of New-York—its Important Uses.

[FROM THE NEW-YORK FARMER]

As society advances, there is greater economy or less waste in the articles of consumption in supplying the wants of man. This is strikingly illustrated in applying to useful purposes old bones, and the shells of clams and oysters. In previous numbers of our work, we have furnished much information in reference to the former, particularly as an article of manure. We now propose to furnish some not less interesting and important, on the use of shells.

Until within six or eight years, the shells of all the shell-fish consumed in this city were, in violation of law,* thrown into the streets, or were, at considerable expense, carted to the upper parts of the city, and thrown into the river, or used for filling up vacant grounds, where they often became a nuisance; but now a little lime thrown on them removes all smell.† Keepers of oyster-houses were under the necessity of paying fifty cents and more per load, to get their shells carted away. Now they are sought after at the rate of two cents per bushel.

About seven years ago, Mr. Knapp commenced, in Second-street, to burn shells for lime. Several unsuccessful efforts wore made prior to his undertaking. At first he was supplied with shells without pay, indeed more than he wanted, they often being dumped on his premises in the night. But such has been the gradual progress of his business, that he now pays three cents per bushel delivered. From September 28 to December 30, 1834, he had delivered at his kilns *thirty thousand and eight hundred bushels* of oyster and clam shells. During this period, and in March, April, and May, these kinds of shell-fish are consumed in the greatest quantities. Supposing he buys the same quantity in the spring, and as much during the remaining six months, the whole amount will be 92,400 bushels. There are two other kilns in the city, which probably buy half as many, equal to 46,200. If to these are added 11,400, as those thrown into the streets, the whole will make 150,000 bushels of oyster and clam shells, as the quantity annually furnished in the city by the consumption of these shell-fish. These shells have in a few instances been brought to this city from Connecticut.

The fuel used in burning the shells, is that which was formerly an expense to the owners of coal yards to get rid of. It is the very fine coal, that can be used for scarcely any other purpose. He now buys it at 25, formerly at 12½ cents per ton. There have been times, however, when he has paid from 1 to $2 per ton.

In the season of business, Mr. K. sells per day, upwards of 50 loads of 16 bushels each—unslacked at 15, and slacked at 7, and that for

* Would not this be a good law in Charleston?—*Ed.*

† This is frequently done in Charleston. Are they not, however, better appropriated as a manure, in the gardens, than as mere offal to fill up?—*Ed.*

manure, at 6 cents per bushel. He prepares it unslacked, and very superior, for white-washing, at 50 cents per bushel.

This lime is principally used for buildings. It is a little more expensive than stone lime, but is considered superior, particularly for expeditious work, and for use in frosty weather. In the latter particular, consists the very great importance of this lime. Formerly it was unsafe to erect buildings in frosty and wintry weather; but now, by the use of this lime, new, elegant, and substantial houses, in every part of the city, are being built in the midst of winter. This is of great importance to builders, mechanics, and laborers, affording them employment in a season of the year, when formerly all such work was suspended. Mr. K's shell lime sets twice as quick as other lime. This quality prevents injury from frost, and enables builders to proceed with less interruptions from frosts and storms. Instances have occurred when, with stone lime, a whole side of a building has been carried up in a day. Before morning, and before the lime sets, a storm commences, and the wall is either materially injured, or tumbles to the ground. Instances have occurred in the use of shell lime, when the most violent winter storms have beat against a recently erected wall of a house, without the least injury.

Cornices made of this lime are durable, and much admired. Mr. K. makes a preparation of this lime for painting, or white-washing out-houses and the walls of rooms. Its price is $1 25 to $1 50 per barrel. It can be made of any colour. This, having some rock salt mixed with it, makes an excellent white-wash for brick, to prevent the access of damp and wet. Mr. Gross, a lumber merchant of this city, has had it on his buildings four years.

For mannre, it has been used to some extent, principally on Long Island and in New Jersey. Among those who have used it, and can speak favorably of it, C. H. Hall, Esq. of Harlaem, Mr. Jones, of Third Avenue, Mr. Howland, of the firm of G. G. & S. Howland, of this city, and Mr. Anderson, of Hallett's Cove. Mr. Hall has made extensive use of it in compost: from 50 to 100 bushels per acre are applied.*

South American Cotton.

[FROM THE FARMER AND MECHANIC.]

Extract of a letter from Col. M'Afee, the attentive representative of his country, at Bagota, to a friend in Baltimore.

"*Bagota, Sept.* 1, 1834.

Meeting with a private opportunity, I have taken the liberty of inclosing to you some of the cotton, with seed, which grows wild in this country, on trees about fifteen feet high, with spreading branches. I gathered myself, what I send you, in the vicinity of Anolaima, a village about ten leagues west of this place, where many of the trees are to be found. Two crops of it may be gathered every year; the first ripens about the last of June, and the second in December. I collected what I send you on the 14th of July, at which time the tree was beginning to blossom for the second crop, which very much resembles, as do the leaves also, the cotton which grows in our country. It

* We give the above as hints to our mechanics and industrious men in Charleston, will they not "go and do likewise."—*Ed.*

is said that each tree will bear from four to six pounds, if carefully collected. I send it to you, believing that you will give it to some of our members of Congress from Louisiana, Florida, or Georgia, that they may make the trial to naturalize it in that region. If this cotton tree could live through the winter of our country, it would be a source of wealth which would save much labour. From the appearance of the tree from which I pulled the cotton, it must be at least twenty years old; I cut a walking cane from one of its branches.

There are many vegetables in this country, which I would like to introduce into ours, and for that purpose I intend to collect all I can, previous to my return.

ROBERT B. M'AFEE.

Management of Seed Beds.

[FROM THE GARDENER'S CALENDAR.]

WATER occasionally the seed-beds of all kinds of trees and shrubs, in dry weather; but this must be practised both before and after the plants begin to appear.

Observe at all times to water these beds with moderation; a little and often must be the rule. Likewise be very careful not to apply the water over hastily at any time, for that would be apt to wash the earth away from the seed, and also from the young plants now beginning to come up; being particularly careful of the more tender and delicate sorts:—generally let the refreshments of water be repeated moderately once every two or three days in warm dry weather; for this will be of great service to all such kinds of seedling plants.

Shade will also prove very beneficial in the middle of hot sunny days, to many of the choice kinds of seedling trees and shrubs, about the time of their first appearing, and for some time after.

These young plants may be shaded from the sun occasionally, by fixing hoops across the beds; then let mats be drawn over the hoops as often as occasion requires.

When there are boxes, pots, or tubs of seedling plants, let them be placed in a shady situation, about the middle, or towards the latter end of this month, where they may have the morning sun only.

All beds of seedling trees and shrubs, whatever, must be kept perfectly clean from weeds.

This should be carefully attended to, for the weeds are much quicker of growth than the young seedling plants of trees and shrubs, and would soon get the start of them if permitted to stand, and would do much damage. Therefore let the weeds, as soon as they appear in the beds, be cleared out, before they get to any great head, performing it by a very careful hand-weeding.

Care of new planted articles.—Water new plantations of the tenderer kinds of young evergreens and flowering shrubs, &c. but in particular those which were lately planted out from the seed-beds; these must not be forgotten in dry weather.

Once a week will be often enough to water any new plantations, even in the driest season, and to those that are but lately planted: but such as have been planted in autumn or early in the spring, will require but very little watering.

Cuttings, either of fruit or forest-trees, flowering-shrubs, or evergreens, which were planted last autumn or this spring, must also be watered now and then in dry weather.

Transplanting.—Evergreens, of most sorts, both seedlings and others, remaining in too close growth, may yet be transplanted; but this should be forwarded as much as possible in the beginning of this month, or wholly completed by the middle, in all the requisite principal plantings.

The Orchard.

[FROM THE CULTIVATOR.]

THE most useful practice has been, so far as our observation has extended, to prune fruit trees in March or April; but it has been recommended by some to omit this work till May, till after the leaves are out; and by others, still further to postpone it till the last of June, or beginning of July. Against March and April pruning, it is urged, that the wood, where cut, is liable to crack, through the influence of the drying winds of those months, and being unprotected by foliage, that the sap is apt to exude and waste, and to corrode the lips of the wound; and that, *at this season*, the efforts of nature to heal the wounded parts, are feeble. May pruning has been objected for the reason, that as at this time all the organs of the plant are in active operation, and the growth more vigorous than in any month of the year, pruning cannot but be prejudicial. The sap vessels are at this time full, and the sap pushing with great force to the extremities; and if the branches are materially diminished, the sap will force itself out near where its flow has been stopped, in numerous shoots, useless for fruit, and unsightly to the eye. Those who have pruned at this season, can judge what force there is in these objections. Most of our trees, and particularly fruit trees, have two periods of growth in a season, the first principally in May or June, and the other towards autumn. Between these two periods their growth is in a manner quiescent. This is declared by many to be the best period for pruning, because the second growth suffices to cover the lips of the wound, or, when small, the wound itself, with new wood and bark; and, in the second place, because the volume and force of the sap are then so much diminished, that few if any shoots or spray are thrown out. I have tried the different seasons, and am of the opinion, that the last mentioned time has a decided preference. For three successive years I have pruned my orchard, after cutting an early crop of grass, say the middle of July, and have witnessed none of the evils which have resulted from autumn and spring pruning.

We recommend to the cautious orchardist to do as we have done: try the three methods, and hold fast to that which does best. Experience is the best school in which to gain instruction, and it is the only school in which most of us are willing to learn.

I will give but three rules in regard to the operation of pruning an orchard, and they will be short ones,

Prune annually. If judiciously done, none but small branches will be required to be cut, and the wounds of those will soon heal.

Make a clean cut, and pare smooth, with a sharp knife, the edges of the wound. This will greatly facilitate the healing process, and preserve the tree from decay.

When the habit of the tree will allow, take out the leading shoot, at the height where you design to have the branches spread. A horizontal branch will produce more fruit than an upright one.

The best application that we have tried (and we have used it to advantage six or seven years) to kill bark lice upon the apple tree, to destroy larvæ of other insects, and to give a clean, healthy appearance to the tree itself, is a *strong* ley, made of wood ashes or pot ash. It is applied to the whole of the trunk of the tree, and branches if necessary, with a brush, nailed or tied to a stick a yard or more in length. The most suitable time to make the application, is between the middle and last of May.

There are advantages and disadvantages in tilling an orchard. In tilled ground, trees are the most vigorous and thrifty; and it seems to be in a measure necessary to plough a few years, to give the young trees a start. Yet even at this period, great care is required not to cut the roots with the plough. But when the trees have acquired six or eight years growth, and the roots become extended, still greater precaution is necessary, or the injury becomes serious. It is not altogether the large roots that are so liable to be cut, for these are often below the plough, but the innumerable fibres that spread in every direction, which escape the ploughman's notice, but which are literally the mouths that convey food to the plant. My practice has been, when an orchard is to be ploughed, to proceed first to dig the ground superficially with the spade, about the tree, two or three feet in breadth, and as many yards lengthwise of the furrow, so that there shall be no balk, and to run the plough shallow near the dung part: and where the orchard is in grass, to dig circles round the trees after harvest, both to facilitate growth, and to prevent injury, in winter, from moles. There is no less caution necessary in using the spade than the plough, to preserve the roots entire. It is a good practice to cut the grass close with a hoe, and then to strew rotten chip dung, if mixed with a little lime the better, about the tree.

On the Produce of 36½ Acres of Land—from a Memorandum Book

[FROM THE CULTIVATOR.]

[We hope the following will be acceptable to our friends in the interior and western part of this section of country.—*Ed. S. Ag.*]

I send you, Messrs. Editors, a memorandum of the produce of 36½ acres of land, the past season, in grain and grass, not on account of any thing worthy of notice in the result, but that others may profit by my *errors*, as well as by my wisdom. The soil is a sandy loam, and no part received but one ploughing for a crop.

17	acres produced	53	tons of	hay,
4	" "	74	bushels	rye,
1	acre "	2	"	wheat,
1½	acres "	574	"	ruta baga,
4	" "	776	"	potatoes,
5	" "	360	"	sound* corn,
4	" "	87	"	barley.
36½	acres.			

* My *soft* corn and small potatoes, and some pumpkins, have fattened about 2,500 lbs. of pork, *finished*, during the last ten days, with *hasty pudding*.

REMARKS ON THE CULTURE.

Hay.—The crop was impaired by the frost of last winter, having killed much of the clover, particularly on about three acres laid down last year. Two acres were in a reclaimed swamp, which were cropped with potatoes in 1833. The wet spring not permitting the ground to be ploughed in due time, and the grass, which sprung up spontaneously, promising something of a crop, it was suffered to remain. The product was but *so so*. Three and a half acres were a ley of four or five years, which ought to have been broken up before; as grass, with me, generally diminishes after the third year. The residue bore a heavy crop, and averaged, by estimation, three tons an acre.

Rye.—As it is my maxim to sow this grain either very early or very late, I was obliged to sow late, in consequence of the ground having been encumbered with a potato crop. The product was a fair crop, though I think that if three or four pecks more of seed had been sown on the acre, there would have been a corresponding increase in the product. The grain was good, but thin, the late sown not tillering like that which is sown early.

Barley.—One half of the barley ground was over-manured, and the grain was prostrated before it got into blossom. The product of this part was of course trifling. It should have had no manure, as it followed a crop of ruta baga well dunged. Besides, it does not answer to have barley ground too rich, or to apply to this crop long manure.

Wheat.—This was sown in February, on ground ploughed in the fall. It promised tolerably well, until it was attacked by the wheat insect, which virtually destroyed the crop. Scarcely a head contained more than three or four kernels, and in some cells, while the grain was standing, I found five and six insects.

Ruta Baga.—This was the poorest crop I ever raised of the kind, and the failure is not attributable to any error of mine, but to the dry summer. It was sown upon an old grass ley. previously pastured, and dunged, ploughed and harrowed just previous to drilling in the seed. The soil was very dry when worked, and there was not sufficient rain afterwards to bring on a decomposition of either the manure or the sod. Comparatively but few of the seeds grew, and the rows were not half filled with plants. In a favorable season, the product would have been more than double.

Potatoes.—Two acres were on a grass ley, well dunged with long manure, and gave a good crop for the season, of more than 300 bushels the acre. This crop received two ordinary dressings, but after harvest I caused all the weeds to be pulled up, and carried to my cow-yard, which, I am confident, added very greatly to the potato crop. One acre was planted on ground habitually wet, and which had been underdrained late the preceding fall. The ground was but imperfectly ploughed, the crop was badly tended, and the product was hardly worth gathering, even in this season of scarcity. The fourth acre was principally on ground where barley had been seriously injured by the frost of the 15th May; it was planted late, with refuse seed. The ground was very dry, and from late planting, bad seed, and a very dry season, the product did not exceed 100 bushels. My practice is not to earth potatoes, after the tubers have begun to form, as earthing them is apt to cause a new set of stolens to start near the surface, which rob the elder ones of their food, and produce potatoes only of a diminutive size. Yet weeds ought to be carefully extirpated.

as they not only impoverish the soil, but shade the ground, to the great prejudice of the crop. The labour of extirpating weeds is amply repaid in the increased product. I think I am warranted in saying, that a clover lay, and long manure, the latter well spread and ploughed under, are admirably adapted both to the corn and potato crop.

Corn.—This and the unproductive acre of potatoes, were grown in a field abounding in springs, and heretofore habitually wet, but which was underdrained the preceding autumn. A part of the ground had been in pasture, and a part under tillage, and the whole was well manured. The hills were planted three by two and a half feet apart, and there remained after the first dressing, four spears in almost every hill. The corn was dressed with the harrow and cultivator, and twice hoed, though but very slightly hilled. Four-fifths gave an uncommon fair crop. Sixty-three selected ears gave a half bushel of shelled grain, averaging more than half a pint each. The other fifth was killed by kindness, or rather from want of personal attention. Having two loads of horn shavings and crushed bones, I directed them to be spread on two acres; but my men, being unacquainted with these materials, and not appreciating their strength as a manure, thought to do me a kindness, and applied the whole to one acre. The consequence was, the stalks were two luxuriant and tender, and the wind prostrated them flat to the ground ere the grain was half grown, and but very little of the corn was fit for the crib.

At present prices, the products I have enumerated are worth about $1,300, and average about $36 to the acre.

The errors in my practice, against which I would guard the reader, are—

1. In sparing grass lands from the plough after the cultivated grasses have mostly run out, and after the product has materially diminished.
2. In sowing *late* rye too thin.
3. Applying manure to a barley crop, the soil of which was already rich enough—particularly long manure.
4. In planting potatoes too late, and with bad seed.
5. In the excessive and wasteful application of bone and horn manure. And finally,
6. In not superintending personally *all* the operations of the farm. We may hire men to *work*; but it is difficult, as my friend Delavan observes, to hire men to *think correctly*.

By way way of postscript I will remark, that I had made, in 1833, in the six acre field in which I grew my corn, about 200 rods of brush and straw underdrains, which cost me about $20, and that I think I am fully remunerated for this outlay in the *increased* product of the field in the past season. B. J.

General Observations on Improvement, and Queries on Herds Grass.

[FROM THE FARMER'S REGISTER.]

Agriculture lies at the foundation of every thing useful, or comfortable, or desirable in human life. It is, therefore, a subject of the utmost importance, not only to the agriculturists themselves, but to the whole

community, that a gradual system of improvement of the soil and of its production, should be encouraged, and those having immediate interest therein, stimulated by all the information possible to be obtained on the subject. I am happy to say, and be able to bear witness, that your valuable periodical has had, and continues to have, a very desirable effect in that way. It has given more light on the subject, and caused more emulation and energetic exertion, than all the agricultural papers ever published in this country. It has been the means of arousing our farmers from their indolence and supineness, and causing them to look around themselves for the means of improving their farms. Many of us now make 20 or 30 loads of manure where we formerly made one—we attend more in person to our business, relying less upon overseers and our negroes to conduct and manage business in their own way. The more attention we give to our farming business, the more interest we feel in their good management and improvement: and, much to our satisfaction, we find our crops come in more abundantly, though the drought last summer injured our crops very much. The cotton crop I think is lessened one half in my neighbourhood—the disadvantages under which we labour to guard our crops from the ravages of stock in this county is a serious one. The time now spent, every year in getting rails, hauling them, and putting up and repairing the fences, would be, under other circumstances, very advantageously applied to the collecting and raising manure, which in a few years, would produce a very desirable change in the appearance of our old worn out fields. I am glad to see that this important matter is now being handled by abler pens than mine; and I hope sincerely, it will not be long before our legislature will take up the subject, and pass a law requiring every person to keep their stock enclosed, and thereby reduce our fencing to standing pastures only. I think the Assembly might do more essential good in legislating upon this subject—a matter coming directly under their supervision—than all they have said, and can say or do, in relation to the constitutionality or unconstitutionality of the United States' Bank, and the removal of the public monies from its vaults, about which so much was said last winter, and all to no good effect.

Some time ago I propounded some queries to you, concerning the seeding and growth of herds grass, which I perceive was lost or mislaid, and therefore not inserted in your last number. I intended to have seeded several acres of land in that kind of grass this fall, but have declined it until spring, the greater part of which is low, wet and oozy, consequently cold and unproductive in corn, except occasionally, when we have a warm dry season, and but moderate rains in summer. Would it be proper to fill up the ditches in preparing the land for the seed, so as to have it an entire level surface, as nearly so as possible? Some of these wet places are within a few hundred yards of my dwelling—it is probable that the health of the family would be affected by the growth of the grass, or its conversion into hay? Or would it be less apt to affect the health if kept constantly grazed close? Your opinion in relation to to the value and growth of this grass generally, would be gratifying to me.

A. B.

Surry Bounty, November 17th, 1834.

On obtaining new and improved Varieties of Grain by crossing.

[FROM THE FARMER'S REGISTER]

In sending my monied contribution to the *Farmer's Register*, which I am sure you will consider the best evidence that I could offer of its merits, I beg leave, very briefly, to suggest a few thoughts on the subject of seed corn. I believe, then, that there is but one genus of wheat, and one of maize, or Indian corn—and that all of the varities of either, known to me, are the results of climate, culture, seasons, soil, &c. &c. and I believe, that by the agency of man, these results may be still further diversified, and made subservient to his good. By the agency of man, in the simple act of selecting from existing varieties of wheat, the agricultural community have been furnished with *that* called *the Lawler*, generally admitted to be less liable to injury by the Hessian fly, than any other known variety—and from the fact, as I believe, that its lower leaves, commonly called the *boot*, do not adhere closely to the stalk; but like the same leaves on rye, fade as the stalks begin to form, leaving any deposite of eggs which would have been sustained to the injury of the stalk, by a gentle pressure of the boot, to perish for want of that pressnre. But whilst the Lawler wheat has the admitted quality of being less liable to injury by the fly than any other known variety, it is cultivated reluctantly, from a belief that it is less productive in grain, than some other varieties. Now, reasoning from analogy, and not doubting the fact, that by means of judicious crosses alone, the English breeders of cattle have been able to create new species of that stock, combining the best qualities of several varieties —why not expect like results from like means, if made to operate on wheat or Indian corn? For instance, we desire a kind of wheat that shall unite the qualities, say of the blue stem and Lawler—is it not very reasonable to suppose, that from the seed of these varieties promiscuously grown in the same field, a stalk would be found, here and there, exhibiting the loose boot of the Lawler, and the many grained head of the blue stem? If yea, my theory for creating a new variety of wheat is established—and the world is welcome to it, without a charge of *patent fees*. That which, in my own opinion, is only probable as to wheat, I have no doubt is true in relation to Indian corn, for every body knowns (or may know by a single experiment) that any two or more varieties of Indian corn, when promiscuously grown in the same field, mix freely and extensively, combining in the product the qualities of the parent seed, more or less equally as it may happen: thus affording the planter of this invaluable grain, by the easiest means imaginable, an opportunity of fashioning his corn to his own fancy. And yet how few for that consideration, or the still greater of adding to the contents of their crib or their purse, have ever made an effort to improve their corn? As exceptions to a negligence so general, I consider it my duty to say, that there are two gentlemen in this county who have made very laudable efforts to improve their corn by means of a careful annual selection of seed. The fancy of one led him to desire that *his corn* should excel in weight, and making his selections with that view, but only from his own crops, has brought it, as I am well assured, to the unusual standard of upwards of sixty pounds to the bushel, being about five pounds heavier than mine, which I would reluctantly compared this improved corn with my own, because I have rated below the average of the county. I have believed that both are

from the same variety, as it existed twenty years ago, proving most conclusively, what may be done, if we would only *try* to do.

The other gentleman whose efforts to improve his corn are so commendable, seems to have experimented more with a view to quantity by measure than by pounds; and instead of selecting for seed, such ears as he would like his next crop to have, prefers taking the upper ear of stalks bearing two or more ears—and he appears very confident, that this mode of selecting seed, continued for, say the last twenty years, has given him a species of corn, which hardly ever fails to have two ears to the stalk—and that his crops have been greatly increased since he adopted it for cultivation.

Rockbridge, Nov. 28th, 1834.

The Morus Multicaulis.

[FROM THE NORTHAMPTON COURIER.]

THE *Morus Multicaulis*, or Chinese Mulberry, many persons believe, cannot be propagated from the seed brought into this country. There are difficulties, it is true, attending it, but they are far from being insurmountable. The Chinese devise every method to destroy their vitality before they allow foreigners to purchase them, and it was not until after repeated trials, that a gentleman in this town was able to obtain a quantity of the genuine seed, through the aid of an American Missionary at Canton. This seed has been generously distributed here, and the experiments of last summer has fully satisfied us, that the leaves are as large and the plant as vigorous and thrifty in its growth, as when propagated by cuttings or layers from the Chinese Mulberry.

We notice in the Horticultural journals, a statement that the French Society of Agriculture have decided that the Chinese Mulberry is not a distinct species, and that the seed will not produce its own kind. Farther, this learned body have decided, the real *Morus Multicaulis* cannot be propagated except by cuttings and layers. Some seed sown in Italy and France have produced other varieties of the Mulberry. This may be the true state of the case in Europe, but it is believed such experience has no application to this country. Our soil or climate, it is to be hoped, will produce from the seed the real plant, and if it should have varieties and those varieties equal or excel those produced from the cuttings, then so much in advance of other experiments is gained. We presume those who propagate the Chinese Mulberry as a traffic will feel offended at the introduction of the genuine seed into this country. The cuttings, thousands of them, have been sold at fifty cents each, but through the perseverence of one of our horticulturists, seed enough for that sum can now be obtained for more than a thousand of the genuine plants.

We have had an opportunity, during the past year, to examine with some attention, the cultivation of the Chinese Mulberry, both from cuttings and layers, and also from the seed. We have been able to perceive no difference in the size and appearance of the leaves of the plant, making adequate allowance for the advantage a layer or cutting has over the seed while undergoing the process of germination. Some seed sown late in the season, produced leaves measuring nine and a half by eight and a half inches, and had they had the advantage of early planting, their size would have been much increased. Even as it was, they exeeeded often the size of the full grown leaves of the genuine *Morus multicaulis*.

PART III.

MISCELLANEOUS INTELLIGENCE.

Agricultural Society of Louisiana.—We are happy to learn that this institution is in a fair way of becoming useful to the State. Under the direction of some of our largest, most experienced, and most enterprising planters, we may safely expect that nothing will be neglected to make it reach the end proposed. A tract of land has been bought by the Society, in the parish of St. James, on which it is preparing to establish its "*model farm;*" and no expense or exertions are to be spared to make it worthy of that name. At this time, when agricultural questions are becoming daily of greater importance to the State, we hail with joy the progress of this institution. It is thought, by many, that Louisiana must shortly abandon the culture of sugar, which has become unprofitable. In that case, what would be its substitute? This is a doubtful question, which might in a year or two be resolved on the *model farm* without loss or injury to a single individual. Perhaps new methods of economy might be introduced, which would enable our planters to produce sugar with less expense, and make its culture profitable. Here, again, for all experiments tending to such a result, the model farm might be made the laboratory.

We had the pleasure a few evenings since to attend one of the meetings of the Directors of this Society. It was proposed and ordered that several acres of cotton should be planted on their farm. If the crop is productive, a great thing will be accomplished for Louisiana; for, so far, it has been believed that cotton would not bear sufficiently to make the culture an object as low down as the parish of St. James; and if this belief is contradicted, any misfortune which might happen to to the State from the cultivation of the cane would be immediately repaired.

But our readers can better imagine, than we describe, the good which might result from this institution. Its creation is one of the many benefits the State has received from the public spirited A. B. Roman, and for which his fellow-citizens will be ever grateful.—*Lou. Adv.*

White Tree Onion and Potato Onion.—These are very superior varieties, and will probably become the principal ones cultivated. The white onion produces a fine large bulb, of excellent flavour, and at the same time a cluster of small sets on the top of the stalk for the next year's planting. Thus rendering the sowing of seed unnecessary. From about six square rods, we this summer gathered eight bushels of fine large onions, and upwards of two bushels of sets for next year's planting. These onions keep remarkably during the winter, as ours were exposed to the whole of last winter's frost in a cold garret, and where they were frozen as hard as stones, without injury. When we consider the saving of the time and trouble in raising sets from seed, this variety will be an acquisition.

The *Potato Onion* is also a most excellent variety, superior to all others except the white tree. Its flavour is very mild; it grows to a good size, and also saves time and labour of raising sets from seed. The onions are set in the ground in the fall or very early in the spring, in the same manner as common onions are planted for seed. In a short time the onion seperates into from five to fifteen small bulbs, nearly all of which grow to good sized onions in a few weeks—generally growing under ground, in the manner somewhat of Irish potatoes, whence the name.

The potato and white tree onions are fit for use from four to eight weeks earlier than any other kind.—*Ohio Farmer.*

Top Onions.—One of the most profitable crops to which a farmer can appropriate a portion of his grounds, is top onions. Independent of the value of the bulb, or full grown onions, the top onions will command from two to three and a half dollars per bushel.—*N. Y. Far.*

Catalpa Tree for Fences.—Gen. Harrison, in his address befor the Hamilton Agricultural Society, recommended the Catalpa for its great durability.

"In noticing the improvements in rural economy in our own neighbourhood, it is painful to observe how little has been done towards substituting more durable fences than those which are in common use. The old common fence, unsightly and disfiguring as it is to our farms, and with all, insufficient and costly, from its great waste of timber, still continues to be the favourite. A change, however, must soon take place, for the country will not much longer supply the materials for constructing it. If any fence composed of rails is used, the best is certainly that of double posts, confined with a cap, and having a worm of one foot to prevent the rails from passing each other. It is much cheaper than the single post fence, more lasting, and more easily repaired. If posts or stakes of locust or mulberry can be procured, they will last many years. But the wood of the *Catalpa* affords, perhaps, a more lasting material than either, is of very quick growth, and easily cultivated. This valuable tree is indigenous to the lower part of Indiana, and grows to a large size on the Wabash, and some of its branches. It ability to resist decay has been sufficiently tested in the neighbourhood of Vincennes, both under ground and in contact with it.

"Over the little stream of the Desha, five miles from Vincennes, one of these trees had fallen, before any emigration had taken place from any of the States to that place. It was certainly lying there in the year 1785, when a colony of Virginians, from the South branch of the Potomac, emigrated to that place, and for many years it served as a foot bridge over the stream. I was informed by a gentleman of undoubted veracity, that it was only partially decayed a few weeks since. This same gentleman (Dr. Hiram Dickson) informed me that a bar post, which was made by his father, and put in the ground at a little stockade work, which was erected in the year 1770, and which has been taken up and removed to his own farm, by his brother-in-law, Major Andrew Purcel, is still sound, and answers the purpose for which it was originally intended.

"The *Catalpa* is much esteemed as an ornamental tree, used as a timber any where but in the vicinity of Vincennes."

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Cure for the Sting of a Wasp.—A few days ago, happening to be in the country, we witnessed the efficacy of the remedy for the sting of a wasp mentioned in one of the late papers. A little boy was stung severely, and was in great torture, until an onion was applied to the part affected, when the cure was instantaneous. This important and simple remedy cannot be too generally known, and we pledge ourselves to the fact before stated.—*Liv. Mer.*

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Why does Soap Curdle with Hard Water?—The sulphuric acid of the sulphate of lime, to which it generally owes its character of hardness, combines with the soda of the soap. The lime and oil, or tallow, being thus freed from their respective combinations, float through the liquid medium in flakes; the phenomenon, therefore, is one entirely of decomposition. On this principle, solution of soap will determine the relative hardness of the water, and is generally employed by the well digger.—*Murray's Manual of Chemical Experiment.*

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Potato Starch.—Let the potato be taken and grated down to a pulp, and the pulp placed upon a fine sieve, and water made to pass through it; the water will be found to have carried off with it an infinite number of particles, which it will afterwards deposit in the form of white powder, separable by decantation, which powder is starch, possessing all the essential properties of wheaten starch.—*Loudon.*

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Prevention of Baldness.—It is true, as a correspondent intimates, that rubbing the head once or twice a day with the cut surface of a raw onion, till the roots become moistened with it, will effectually prevent the hair from falling off? As the remedy is very simple, and the number who are suffering from approaching baldness, numerous enough to make a thorough trial, it is important to collect the experience of any who may have been benefitted by the application.—*Boston Med. and Sur. Jour.*

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Wonders of Chemistry.—Aquafortis and the air which we breathe are made of the same materials. Linen, and sugar, and spirits of wine, are so much alike in their chemical composition, that an old shirt can be converted into its own weight in sugar, and the sugar into spirits of wine. Water is made of two substances, one of which is the cause of almost all combustion or burning, and the other will burn with more rapidity than almost any thing in nature. The famous Peruvian

bark, so much used to strengthen stomachs, and the poisonous principle of opium are formed of the same materials.—*N. E. Far.*

Mode of Extracting Wax from Honey Comb.—Have on the fire an open vessel of boiling water, and standing by the fire an open vessel of cold water; put the comb close tied in a canvas bag, into the boiling water, and repeatedly squeeze it down with a stick or large wooden spoon; the wax will come through the bag, and swim on the top of the water: skim it off and put it in the vessel of cold water; by repeatedly squeezing the bag and skimming, every particle of wax is obtained; when congealed on the cold water it may be taken off and melted and cast into moulds, of any convenient shape for sale.—*Glasgow Mechanic Mag.*

Liquid Manure.—Our friend J. H. J. makes inquiries of us respecting Liquid Manure. Liquid manure is undoubtedly a valuable application, and quick in its operation, because the matter which acts either as a food or a stimulus to roots or plants is already dissolved and ready to be drawn up into the plants. Hence, it must be both more quick in its operation and less durable in point of time, as it will be sooner taken up and exhausted. It requires, however, some more expense in managing it than the more solid materials. And in this section of the country, where so little attention is paid to manure of *any kind*, it looks strange to many that a man should think of saving liquid manure. If every farmer would however make some arrangement on his farm or around his barns to save this valuable material, we doubt not that he would be amply compensated in the increase of his crops. A cistern built beneath the floor of his tie up, with gutters leading the urine into it would preserve a large quantity of this kind of manure. Such a cistern should have a false bottom perforated with holes, which would act as a strainer, and thus separate the more liquid parts from the thicker. Such a contrivance in necessaries would save much that is now suffered to sink into the soil or evaporated by the sun.

In some parts of Europe they make great account of liquid manures, especially in Flanders on their flax grounds.

This manure, says Loudon, is gradually collected in subteraneous vaults of brick work, at the verge of the farm next to the main road.

They are generally forty feet long by fourteen wide, and seven or eight inches deep, and in some cases, are constructed with the crown of the arch so much below the surface of the ground as to admit the plough to work over it. An aperture is left in the side through which the manure is received from the cart by means of a shoe or trough, and at one end an opening is left to bring it up again by means of a temporary pump, which delivers it into carts or barrels prepared for it.

They allow 2480 gallons, beer measure, to the English acre. A large barrel, with a tube in one end, and another tube attached to this at right angles to it and perforated with small holes, would spread it equally over the surface of the land, if it is desired to use it in that manner.—*Maine Far.*

MONTHLY CALENDAR

OF

HORTICULTURE AND FLORICULTURE

FOR MARCH.

The month of February has been one of the severest ever known in Carolina. The thermometer was below the freezing point for eight days in succession, and on one occasion, had fallen down to 2° in one part of the city, and it is said in another, it had been down to *zero*. The injury which vegetation has sustained is incalculable. Our prospects from Peas, Cauliflowers, Cabbages, and from all the vegetables sown in the early part of the last month, as well as in autumn, have been entirely destroyed, and the Farmer and Gardener must exercise their patience in planting their gardens over again, and in attending precisely to the same work which we directed in the last month, and they will have the satisfaction of knowing that although their gardens have been somewhat retarded by the severity of the weather, yet if they commence early in the present month and persevere their attentions, they may yet be able to have a good spring garden.

VEGETABLE GARDEN.

Sow the Marrowfat and such other kind of Peas as are calculated for a late crop, they do not require as much protection as those sown at an earlier period; let them be sown in trenches 5 feet apart, and let the seeds be covered about 3 inches deep. If your Peas, sown last month, have not been destroyed by frost, and have come up, hoe them when they are about 3 or 4 inches high, it will strengthen and promote their growth. If you have planted Marrowfat and the larger kind of Peas, you should give them sticks of about 6 feet high, and do not postpone this necessary part of your work later than when the plants have arrived at about 6 inches in height. Sow Early York, Sugar Loaf, and the large kind of Cabbage seed. Sow Turnips, Carrots, Parsnips, Radishes, Lettuce, Small Sallading, Parsley, Tomatoes, and Beet and Spinach Seeds. Let these be sown as early as possible. Towards the end of the month plant Watermelons, Muskmelons, Cucumbers and Okra and Celery Seeds. It is not yet too late to sow Onion and Leek Seeds, and to plant Irish Potatoes. Let your Early York and Carrot Seeds, at this season of the year, be of English growth. The best sort of Parsely is the curled. Sow yonr Carrots and Parsnips on good ground, dug a spade deep on beds 4 or 5 feet wide, containing 4 trenches, in which the seed is to be thinly sowed and lightly covered. Your Turnip bed, which may be from 5 to 10 feet wide, must be carefully turned up, the seeds may be sown in drills or broadcast, and the plants be suffered to grow from 7 to 10 inches apart from each other. We have been most successful in raising Irish Potatoes in our gardens around the city, by planting them in rows two and a half feet apart, covering them over with coarse sedge marsh grass, the tops of decayed vegetables or straw, to the thicknes of 5 or 6 inches; covering this layer with earth. Let your Watermelon, Muskmelon and Cucumber hills be made of light rich earth, 10 inches high and 18 inches broad on the top, on which you may plant 7 or 8 seeds.

FRUIT GARDEN.

Many of our Peach, Apricot, Nectarine and Fig Trees have been destroyed by the frost. It will be well to examine them and replace those which have been killed, by others. It is not yet too late to transplant all kinds of fruit trees. Let your trees be now carefully pruned. Dress your Strawberry and Raspberry beds, and set out cuttings of Fig trees. Our Orange trees have nearly all been killed by the frost, and the few that are remaining are scarcely worth preserving. This would be the time to rid the country of one of the most troublesome insects that has ever infested our Orange trees. It is not much larger than the point of a pin, envelopes itself in a white covering, and in the course of a single summer covers the tree from the root to the topmast branches, and destroys the tree as well as the fruit. It has not, that we have heard, extended beyond four miles from the city, and if every Gardener would consent to cut down the stumps of his Orange trees which are now of no value, the insects which feeds only on this tree would be entirely extirpated, and it might be a century before it would be again introduced. We give this advice in great earnestness, although we are aware that it will never be followed. We have for years tried every other means of conquering this little pest, and fear that this is the only plan by which it can be eradicated.

FLOWER DEPARTMENT.

Our Green-houses in Charleston did not preserve our tender exotics. That of Mr. Nicholson, in the suburbs of the city, was the only one which resisted the cold. It will require time, patience and perseverence to restore the beauties of Flora, but by proper attention this may all be accomplished. Set out cuttings of Roses, Geraniums and Green-house plants. Set out Tube Roses. Sow the seeds of Amaranthus, Balsams, Marygolds, Careopsis, and of all kinds of annuals. This is a good season to procure Trees, Shrubs, and many beautiful species of flowering plants from the fields and woods. We will enumerate a few. The Laurels, (Magnolia, Grandiflora and Glauca, Gordonia Lasyanthus, and the Liliodendron Tulipifera.) Fringe Tree, *(Chionanthus virginicus.)* The Gerardia, *(Gerardia quercifolia.)* The Strawberry Tree, *(Euonymus Americanus.)* The Aronia arbutifolia; the Snow Drop Tree, *(Halesia tetraptera.)* The Bush Honeysuckle *(Azalea nudiflora* and *Azalea viscosa.)* The Scarlet Honeysuckle, *(Caprifolium sempervirins.)* The Flax, &c. &c.

FLOWERS IN BLOOM.

The only native plants that bloom this year in February, are the *(Lanus geniculata,)* a small bush that grows around our ponds in pine-barrens; the Dandeleon or Exotic *(Leontodon taraxacum,)* and the *(Draba carolinianum,)* a humble little plant growing on the commons at Hamstead, near Charleston.